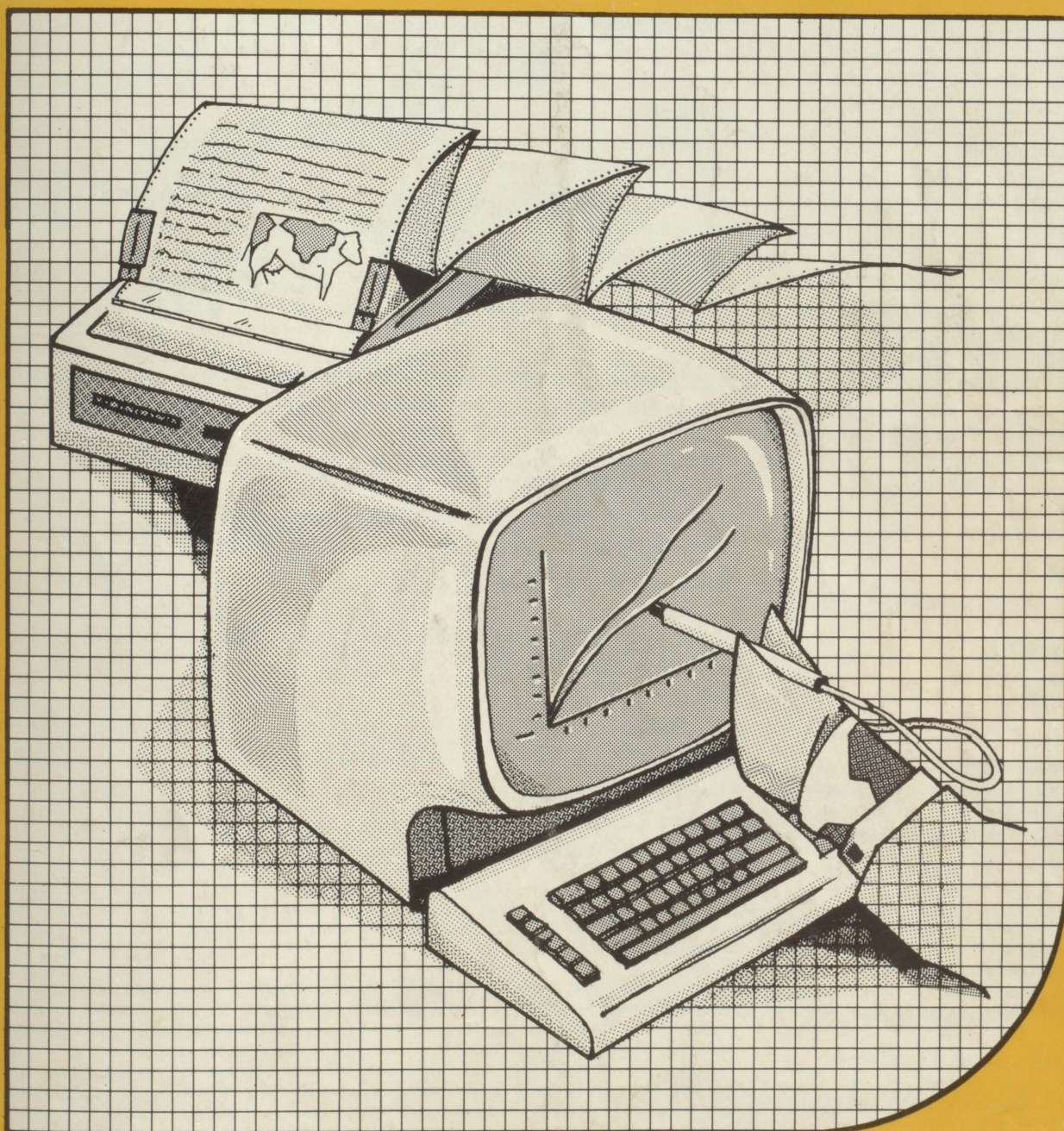
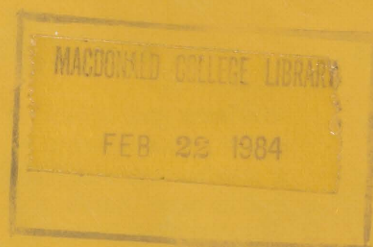


THE MACDONALD JOURNAL

FEBRUARY
1984



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Editor:

Hazel M. Clarke

Publications Committee:

Co-ordinator: Serge Lussier
Laurence Baker
Hazel M. Clarke
Professor Bruce R. Downey
Professor E.R. Norris

Regular Contributors:

Marina Costain
Macdonald Extension Service
for assistance & consultation

Jim Currie
Diploma Program
for "Diploma Corner"

Emeritus Professor R.H. Estey
Department of Plant Science
for "Fun Fact Fable Fiction"

Dr. A.F. MacKenzie
Associate Dean, Research
for "Seeking Solutions"

Tom Thompson & Kathy Whitehurst
Martlet House
3605 Mountain St.,
Montreal, Que.
H3G 2M1
for news from the Graduates' Office

Cover Design by:

John Starkey, artwork by
Sandra Letendre.

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Cover Story

The computer has played a tremendously important role in the remarkable advancements made in the dairy industry in modern times. If, as artist Sandra Letendre predicts on her cover, our bovine friends ever take over their own programming, it is just possible that Dr. John Moxley, for one, could be "looking for a new job." Until bossy becomes boss we would like to point out that this is the fifth year that Dr. Moxley, Director of DHAS and Professor in Animal Science, has assisted in co-ordinating a special February dairy issue. In all some 12 people have contributed material for the dairy section. With expertise such as this it is no wonder that Quebec is Canada's leading dairy province. To complement the contributions of Mac staff, we are pleased to have an article from Elwood Hodgins, Dip. '57, Vice-Chairman of the Canadian Dairy Commission. Mr. Hodgins gave a seminar here recently, and we feel his comments on the CDC will make for timely and informative reading.

MACDONALD JOURNAL SPONSORS

I am convinced that every reader of the Macdonald Journal is well aware of the problems associated with the financial viability of an enterprise during these difficult times. This is true whether the enterprise be an industrial concern, a government agency, a farm or a home. Financing the Macdonald Journal has become a very real issue with us largely because we are faced with annually increasing publication costs that must be met with a fixed income.

As of the summer of 1982, we have attempted to deal with this situation by reducing our annual issues from ten to four, while doubling the pages per issue. This provided some relief, both in publication and mailing costs. Reactions by our readers to the new format have been remarkably favourable, and have provided us with a firm indication that the Macdonald Journal should maintain its central role in our Extension Services. However, our financial problems have persisted.

During the past months, we have been approaching our friends in industry with a request for a donation towards the costs of publishing the Macdonald Journal. We are well aware that the circulation of the Journal falls far short of the level required by most firms to justify support from their advertising budgets. Therefore, we must rely on our friends sharing our belief that the Journal is doing something worth-while for the general community and is worthy of support.

A listing of the first sponsors of the Macdonald Journal may be found below this message. We are most grateful for this support which has been given, more or less, in a pioneering sense. It is our hope that this list will grow during the immediate future, thereby ensuring our ability to continue publishing the Macdonald Journal.

L.E. Lloyd
Vice-Principal

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Don't reduce the wrong expenses!

by S. Bowman
Director, Farm Practice
Diploma in Agriculture Program

Corn and soymeal prices are about 50 per cent higher than last year and, on top of this, due to the dry weather, your yields of grain and even forage are about 10 per cent below last year. What will you do?

If you are like one farmer I've talked to, you're likely saying, "I just cannot afford to feed them (dairy cows) as well as last year. I can't afford to buy feed so I'll just have to stretch it out!" Unfortunately, this typical cost reduction strategy could bankrupt many farmers this winter or, at best, leave them financially crippled.

Let's examine the plight of one farmer who, in late August, decided to follow this typical path for the exact same reasons I mentioned above. In his case, however, his reduced corn acreage compounded with the lower yield led to only 70 per cent as much cob corn in storage this year as last. Thus, he reduced his grain feeding by about 30 per cent to stretch out the cob corn. He did increase silage feeding slightly since he usually had some left over by spring. Combined with this, he reduced his home-made grain mix from a 16 per cent protein mix to a 13.5 per cent mix in order to save costs by purchasing less soymeal.

This farmer had an Ayrshire herd of 46 cows (about 39 milking and seven dry cows) with an average calving interval of 412 days (13.5 months). Based on his 1982-83 milk shipment statements, he was shipping an average of 16.0 litres (at 4.6 per cent B.F.) per cow milked per day, and this was fairly steady throughout the year. However, by mid-November his production had declined to an average shipment of only 11 litres (at 4.6 per cent B.F.) per cow milked per day.

Let's examine his financial predicament by looking at the Table on this page where we can see that indeed his daily feed costs were reduced by \$13.66, and he could notice this in his pocketbook. The problem, however, was becoming very apparent to the farmer by mid-November. His production had



ITEM	1982-83			Late 1983		
	Amount	Unit Price	Total	Amount	Unit Price	Total
Concentrate Mix (Per 1,000 kg)						
Soymeal — Purchased	206 kg	360/t	74.16	148 kg	410/t	61.68
Cob Corn — Home grown	756 kg	100/t	75.60	814 kg	120/t	97.68
Minerals — Special order	38 kg	18.75 bag	28.50	38 kg	18.75 bag	28.50
Mixing Costs, etc.			20.00			20.00
TOTAL	1000 kg		198.26	1000 kg		207.86
Feed Costs/Milking Cow/Day						
Concentrate Mix (Above)	6.0 kg	198/t	1.19	4.0 kg	208/t	0.83
Hay	6.0 kg	60/t	0.36	5.0 kg	60/t	0.33
Corn Silage	18.0 kg	20/t	0.36	20 kg	20/t	0.40
TOTAL			1.91			1.56
Daily Feed Costs (Milk Cows)			74.50			60.84
Daily Feed Costs (Dry Cows)			6.00			6.00
TOTAL DAILY FEED COSTS (Excluding replacements)			80.50			66.84
Daily Milk Income	16l/cow	45/hl	261.40	11l/cow	45/hl	179.70
DAILY INCOME OVER FEED COSTS			182.80			113.30

reached a level of 11 litres/cow/day. His November milk cheque was some \$2,400 less than his July cheque. As a result, his daily income over feed costs (a potential profit measure) had dropped by almost \$70; this is \$2,000 for the month.

When we examined his problem it became very obvious that he must immediately get his cows back on full feed and begin feeding a balanced ration. Production cannot be expected to regain previous levels for some time but, we hope, soon enough to prevent quota loss and financial collapse. In re-balancing his ration, we found we could maintain the hay intake and

further increase silage to utilize his feed resources but that we would have to increase the grain protein to 17 per cent. Mineral costs were reduced by using a commercial preparation that fully balanced the cows' needs. His past feeding levels were deemed acceptable given the extra silage being fed. This resulted in a daily feed cost of \$2.05, but a fully balanced ration

To date (December) production was up again to 14.5 litres. It is hoped that with the better balanced ration it will climb beyond 16 litres and, by the end of the dairy year, help the farmer maintain quota and re-balance his bank account.

ACHIEVEMENT IN DHAS

by Professor J.E. Moxley
Department of Animal Science

"Don't tell them your herd average; they will never believe you." This was the advice one Vermont DHIA dairyman passed on to a fellow dairyman invited to participate in the production of DHAS (Dairy Herd Analysis Service) at the Salon d'Agriculture in Montreal in 1966. That dairyman had a herd average of about 6,000 pounds of milk per cow (6,810 kilograms). Today, over 500 Quebec DHAS herds have exceeded that average. Lionel Laroche, of Victoriaville, started his dairy business with 30 grade cows that same year. When he was invited to address the National Conference on Milk Recording in October, 1980, on "The dairy producers' needs in the 1990s," his herd average was over 21,000 pounds of milk per cow (9,534 kilograms) on DHAS.

In December 1966, there were 150 herds enrolled on DHAS. By the end of 1982, there were 8,140 dairy herds in six provinces (Quebec, Nova Scotia, New Brunswick, Prince Edward Island, Newfoundland, and Saskatchewan) enrolled on DHAS. This represented 44.2 per cent of the herds enrolled on a milk recording program in Canada in 1982. During the 1970s, DHAS accounted for almost 100 per cent of the net growth in milk recording in Canada. At the National Milk Recording Conference in 1980, an objective was set of having 100 per cent of the national herd on milk recording by 1990. DHAS was identified as the one program in

Canada that had the desired elements of a milk recording service.

Quebec has long been recognized as the major milk producing province in Canada. With 40 per cent of the Canadian cow population, this was inevitable. Today, Quebec dairymen have combined quality of cattle with management to improve the production capabilities of the Quebec dairy herd. This is well illustrated in a comparison of the performance of Ontario DHIA and Quebec DHAS supervised herds presented in Table 1.

Since 1970, DHAS in Quebec has been a joint service of the Ministry of Agriculture and Macdonald College. DHAS was introduced as an owner sampler program because the service was less costly to provide and still gave all the information necessary for herd management decisions. A larger milk recording base was necessary to prove young bulls entering the Quebec AI unit (CIAQ). Only lactation records from supervised herds are accepted for sire proofs, thus the Ministry asked DHAS to initiate a supervised service. Dairy men on the official program were expected to breed at least 20 per cent

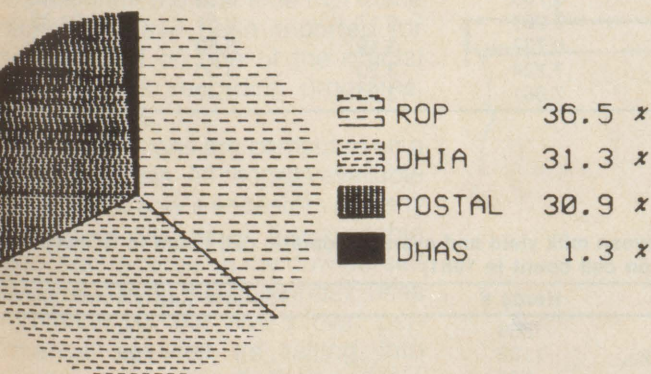
of their cows to young bulls being sampled by the AI unit. In general, these dairy men have equalled or exceeded this objective. Today, the majority of the lactation records to prove young CIAQ bulls come from DHAS supervised herds.

In 1974 DHAS commenced reporting annual herd averages for the herds on the DHAS supervised program based on BCAs (Breed Class Averages) for milk and fat. By the end of 1974 Quebec had 332 herds on the supervised program. The supervised program in Ontario had been in existence for over 30 years with 1,502 herds registered in 1974. Between 1974 and 1982, the enrolment in Quebec and Ontario increased by 779 and 623 herds, respectively. Table 1 shows the rate of improvement in milk production in the Ontario and Quebec supervised herds during this period. In 1974 Quebec herds were nine points behind the Ontario herds but, by 1982, the Quebec population was ahead by 10 BCA points.

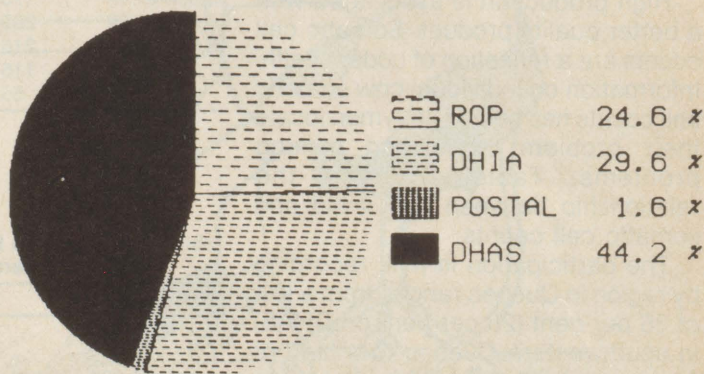
What did this represent in milk yield? For Holsteins, one BCA point is considered to be equivalent to 53

Table 1. Change in production in Ontario DHIA and Quebec supervised herds between 1974 and 1982.

Year	Based on BCAs for Milk		Difference
	Ontario DHIA	Quebec DHAS	
1974	111	102	- 9
1976	117	113	- 4
1978	124	124	0
1980	127	132	+ 5
1982	127	137	+ 10
NET CHANGE 1974-1982	16 points	35 points	



Distribution of herds on milk recording in Canada by program in 1966.



Distribution of herds on milk recording in Canada by program in 1982.

kilograms of milk on a mature equivalent basis. Forty kilograms per BCA point is more appropriate on a herd basis involving cows of different ages. The 16 BCA point gain in eight years for Ontario herds translates into an increase in production of 80 kilograms per cow per year. The corresponding 35 BCA point gain for the Quebec herds translates into an improvement of 175 kilograms of milk per cow per year. This is more than double their Ontario counterparts.

Having a better BCA index is not good enough unless it translates into more earned dollars per cow. The increase in dollar return per cow with increasing levels of milk yield in Quebec supervised Holstein herds for 1982 is given in Table 2. It has been calculated from this table that each increase in milk yield of 100 kilograms is worth \$23.90 in returns over feed cost per cow. In 1982 those extra 10 BCA points advantage of Quebec DHAS over Ontario DHIA herds would be worth \$95.60 per cow (10 BCA points x 40 kilograms x \$23.90).

Reduction in milk quotas in the 1982-83 period has required dairymen to make adjustments to their milk production plans. With management information, most DHAS herds have adjusted by reducing herd size and continued to improve production per cow. For the first half of 1983, the average herd size had been reduced by over two cows per herd compared to 1982.

DHAS has provided the management information that has led to the production of a better product. Protein is the most important nutritional component of milk. The properly fed, high-producing herds are producing a product higher in protein content. This can be observed in Table 3. Unfortunately, the price of milk is tied to fat content.

High production is associated with a better quality product. Somatic cell counts are a reflection of udder health. Information on individual cow somatic cell counts has helped dairymen locate their problem cows and milking problems. Table 4 shows the relationship between milk yield and somatic cell counts.

The participation in milk recording by region in Quebec ranges from a low of 36 per cent (28 per cent on DHAS) in southwestern Quebec to a high of 54 per cent (46 per cent on DHAS) in the Lac St-Jean region. Possibly the

GROWTH OF MILK RECORDING IN CANADA
BY TYPE OF PROGRAM
1966 TO 1982

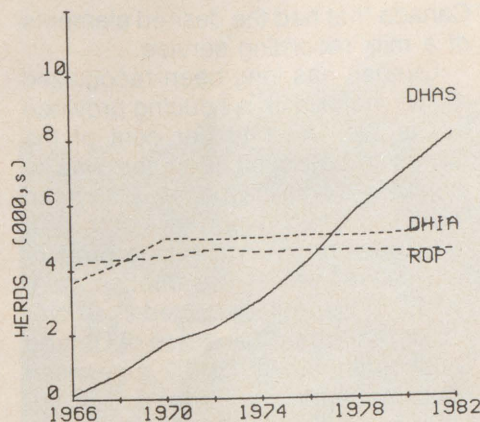


Table 2. Production levels in Quebec Holstein supervised herds with total and return over feed costs per cow for milk in 1982.

Milk Production Level (Kg)				Average Return Per Cow (\$)
Range	Herds	Average	Total	Return Less Feed Cost
<5,500	64	5,167	1,781	1,032
5,500-5,999	173	5,785	1,991	1,195
6,000-6,499	269	6,257	2,148	1,305
6,500-6,999	216	6,737	2,304	1,412
7,000-7,499	116	7,224	2,477	1,526
>7,500	55	7,962	2,714	1,701
Total	893	6,434	2,208	1,343

Table 3. Level of milk production, milk composition, and price received per 100 kilograms in QDHAS official Holstein herds in 1982.

Milk Production			Milk Composition		
Range (kg)	Herds #	Average (kg)	Protein	Fat	Price/100 kg (\$)
<5,500	64	5,167	3.13	3.52	34.36
5,500-5,999	173	5,785	3.16	3.51	34.42
6,000-6,499	269	6,257	3.17	3.51	34.33
6,500-6,999	216	6,737	3.19	3.50	34.27
7,000-7,499	116	7,224	3.20	3.50	34.27
>7,500	55	7,961	3.21	3.47	34.11

Table 4. Relationship between milk yield and average somatic cell count in QDHAS herds (for 2,331 herds on cell count in 1981)

Milk Yield (kg)	Herds #	Somatic Cell Counts (000/ml)
<5,500	566	336
5,500-5,999	1102	290
6,000-6,699	555	260
>7,000	108	232

benefits of milk recording as a management tool has not been as fully appreciated or as necessary for survival in some of the older milk producing areas of the province.

Over the past 15 years, dramatic changes have occurred in Quebec's dairy industry. Forage production and dairy cattle feeding practices have changed dramatically. Milking equipment and milk handling equipment have been upgraded. The genetic merit of the cattle population has been improved through efficient use of AI, and the processor and consumer are receiving a better quality product. DHAS has provided the management record services which have enabled dairymen to make these changes efficiently.

Genetic Evaluation of Cows

R. Moore
Assistant Director
Dairy Herd Analysis Service

Since 1975, dairy cattle breeders in Canada have consulted sire proofs that are calculated using the direct sire comparison method to select the sires to use to breed for increased milk and fat production. Twice a year Agriculture Canada publishes the Canadian Dairy Sire Comparison which contains the production evaluations or ratings of the dairy sires. These ratings are an estimate of a sire's genetic value that will be passed on to his daughters. They are used on the yields of daughters' production tested in official milk recorded herds, as well as on the bull's pedigree.

As we can compute a sire proof, which is an estimate of a bull's genetic transmitting ability, so also can we compute a cow index, which is an estimate of a cow's genetic transmitting ability. The method currently used in Canada to evaluate cows is that developed by Dr. Henderson of Cornell University. This method, which is similar to the direct sire comparison, was used by Dr. L.R. Schaeffer at the University of Guelph to compute cow indices in 1981 and 1982. As of 1983, Agriculture Canada assumed responsibility for producing cow index reports.

Herd owners on the Record of Performance (ROP) program for dairy cattle have been receiving cow index values for the cows in their herds. However, the values computed in late 1983 will mark the first time that these indices will have been reported for cows enrolled on one of the official provincial milk recording programs, such as DHAS.

Cow evaluations are computed on a thin-herd basis. All records available on a herd on a cow's ancestors and any offspring as well as all the available production records on the cow herself are used. Thus, the cow index uses information on the cow's own performance as well as taking into consideration all of the genetic relationships within the herd. Genetic

differences that may exist between different herds are estimated through the use of sire proofs. By including the most recently available sire proofs for the male ancestors of the cows, the cow indices have the same base group as the sire proofs. This allows the comparison of cows that have been indexed in different herds.

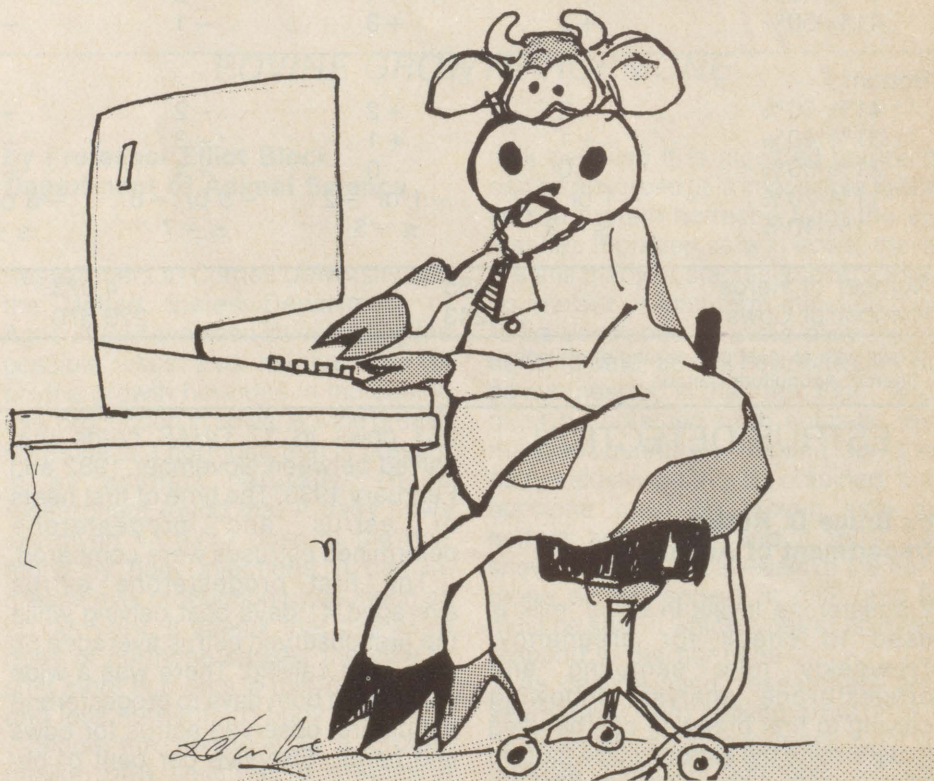
The data base for cow indexing is the production records, expressed as units of BCA, of cows that have completed records on an official Canadian milk recording program since 1960. Also, records in progress on cows for more than 90 days are extended to 305 days and used in the evaluation. If a cow has been on test in more than one herd, she is evaluated in both herds and a combined index value is given. Daughters of foreign sires that do not have an official sire proof in Canada are not indexed as such an evaluation might be misleading.

The index value of a cow for milk or fat is the expected additional yield from daughters of a cow over daughters of a cow with a zero index for the same breed the same herd

and by the same sire. These values, like sire proofs, are only exact as an average as there can be much genetic variation between daughters of the same cow. Half of the daughters of a cow with a +10 index would be expected to produce more than 10 BCA points higher than a zero rated cow, while the other half would produce less.

As noted, cows are indexed using the information on all lactation records. This differs from the Canadian sire evaluation which is based on first lactation daughters. This is done to take advantage of as much information as possible about the cow. Even so, cow indices generally will not have the same degree of accuracy as the sire proofs for A.I. bulls having many daughters in many herds.

New cow indices will be computed once or twice a year. The index value of a cow may change as new lactations are included or if the sire proofs change. Keep in mind that the change to a rolling base for sire proofs means that the base is updated annually with each round of spring proofs. If there is continued genetic progress within a breed, a cow's index



Artwork by Sandra Letendre

will likely decline with time (as will sire proofs).

Cow indices are numerically lower on average this time than those that have been previously reported. This is a result of including the new sire proofs that had been computed using the new rolling base. The new base group of sires is a group of highly selected bulls, since due to its definition the base is mostly comprised of A.I. bulls in current use. Thus for the Holstein and Jersey breeds, it is not at all surprising that the genetic merit of the average cow is below that of the base group of bulls — below zero. As can be noted in Table 1, for these two breeds a larger percentage of the cows will have a negative index. For all three breeds in Table 1 the average cow index within the breed is not zero. This is the consequence of using an up-to-date base for sire evaluation and thus a similar base for cow indexing.

An important point to note is that

cow indices, like sire proofs, compare the cows within the population to each other. Thus, Table 1 allows one to determine where a cow ranks within a specific breed. For example, a Holstein cow with a +1 index for milk ranks in the top 21-30 per cent of the active Holstein cows. Put another way, this cow has a genetic value for milk production that is better than 70 per cent of the current cows that were evaluated. To rank in the top 21-30 per cent of its breed for milk production, an Ayrshire cow would require an index value of +5.

The high indexing cows are generally the ones that will attract the attention of the artificial insemination units. With each cow index run an Elite Cow List is distributed to the Canadian A.I. units. Generally, this list will include the top one per cent of the registered population for both milk and fat indices as well as meeting minimum conformation standards. The

indices thus serve as a screening tool to identify cows as potential bull dams.

Genetic progress for production could be increased if the cow index is used as a tool by the dairyman when deciding which cows to keep and which to replace. However, the potential for the voluntary culling of cows in a dairy herd is limited. The cow index provides another piece of information than can be used wisely along with all the other factors that will determine whether a cow stays in the herd.

Finally, for the cow indices to be valid genetic evaluations, all cows in the herd must be subject to the same conditions. The indexing procedure cannot account for favoured treatment that may be provided for an individual cow. Pampering a good cow to insure that she has an opportunity for an even better record is understandable. However, this will have an adverse effect on the validity of the cow index.

Table 1. Relationship between the index of a cow and its rank in the supervised cow* population

Rank	Ayrshire		Holstein		Jersey	
	Milk	Fat	Milk	Fat	Milk	Fat
Top 1%	≥ +12	≥ +11	≥ +8	≥ +9	≥ +10	≥ +9
'' 2%-5%	+9 to +11	+9 to +10	+5 to +7	+5 to +8	+6 to +9	+5 to +8
'' 6%-10%	+7 or +8	+7 or +8	+4	+3 or +4	+4 or +5	+4
'' 11%-20%	+6	+6	+2 or +3	+1 or +2	+2 or +3	+2 or +3
'' 21%-30%	+5	+5	+1	0	+1	+1
'' 31%-40%	+4	+4	0	-1	0	0
'' 41%-50%	+3	+3	-1	-2	-2 to -1	-1
Bottom						
'' 41%-50%	+2	+2	-2	-3	-3	-2
'' 31%-40%	+1	+1	-3	-4	-4	-3
'' 21%-30%	0	0	-4	-5	-5	-4
'' 11%-20%	-1 or -2	-1 or -2	-5 or -6	-6 or -7	-6 or -7	-5
'' 1%-10%	≤ -3	≤ -3	≤ -7	≤ -8	≤ -8	≤ -6
Number of Herds	655		4,073		304	
Number of Cows	28,243		229,670		14,246	

*Cows with at least one calving after January 1, 1981.

Source: Agriculture Canada

ESTRUS DETECTION

by **Bruce D. Rutley**
Department of Animal Science

Progesterone levels in cows' milk is used to check for pregnancy. Tri-weekly milk sampling and progesterone analysis following calving to first breeding can be used to determine the estrous cycle pattern of an individual cow. This was done for

353 cows in 32 DHAS herds that calved between November 1982 and February 1983. The time of first heats or estrus and progesterone determined estruses were compared.

The first progesterone estrus averaged 41 days post calving while the first observed estrus averaged 58 days post calving. There was a wide variation in both days to progesterone estrus and observed estrus for cows and herds. Sixty-five per cent of observed heats corresponded to

progesterone detected estrus. Only 17 per cent of the observed heats corresponded to the first progesterone determined estrus. First observed heats most closely associated with second progesterone determined estrus were correct 60 per cent of the time. Second observed estrus periods coincided with progesterone detected estrus periods 76 per cent of the time. This gives some indication of the extent of the problem of estrus expression and ability to detect heat.

What is protected protein for dairy cows?

by Professor Elliot Block
Department of Animal Science

Recently we have been hearing and reading about new concepts in feeding protein to dairy cows. Terms such as protected protein, bypass protein, and soluble protein all have a similar meaning but the questions are: what do they mean specifically and does the cow need them?

There are two types of feed protein that enter the rumen (the first stomach) of the cow: soluble protein, which, as the name implies, is protein that goes into solution (dissolved) in the rumen fluid and is easily broken down by bacteria to ammonia, and insoluble protein, which is protein that is not dissolved in the rumen fluid and is more resistant to bacterial degradation. Sometimes terms such as degradable and undegradable protein are used. These are terms similar to soluble and insoluble protein. Protein that is not degraded in the rumen is able to "bypass" the rumen to the small intestine where it is digested and absorbed as amino acids (the structural units, or building blocks, of proteins). Protein that is degraded in the rumen is either re-synthesized to bacterial protein or is absorbed as ammonia from the rumen.

The next question is what this has to do with dairy cow nutrition. In the past we have not paid much attention to the types of proteins fed to cows because we assumed that the rumen bacteria altered (by degradation and re-synthesis) the protein sufficiently to meet the cow's requirements for the amino acids she needs. These amino acids are the building blocks of protein, which when hooked together in a chain form a protein. The amino acids are really what the cows need to maintain herself and to produce milk. Recently we have found that the bacterial protein plus the protein that "naturally" bypasses the rumen may not supply enough amino acids to high producing cows to produce very high quantities of milk using our normal rations. This has been shown by replacing various proteins and amino acids in the cow's intestine (by means of a tube), which resulted in an increase in milk production.

Although the experimental

technique described above works, it is, of course, an impractical approach for commercial farms. The problem is that when we feed proteins or amino acids that are capable of bypassing the rumen we sometimes see a positive response in milk production but other times we see no response. It should be noted that we never see a negative response. Obviously then there must be certain defined conditions where a benefit would be obtained from bypassing proteins or amino acids. The problem is that we do not know what these conditions are exactly. Therefore, our best recommendation at present is to provide a more insoluble protein when we know that the normal ration has a high level of soluble protein. Ration ingredients such as corn silage, soybeans, soybean meal, and corn have high protein solubilities, and when these ingredients are in a ration in high quantities it may be beneficial to add an insoluble or "protected" protein source.

Any protein source can be protected from bacterial degradation in the rumen by various methods. The application of controlled heat for a specific time reduces protein solubility;

therefore, we can buy commercial supplements of heated or heat extruded soybeans or meal designed for low solubilities. There are also chemical treatments that reduce solubility but these are less available commercially. At present, the most inexpensive way to reduce protein solubility in a ration is to include ingredients that have a low solubility "naturally" such as: distillers' grains, brewers' grains, corn gluten meal and corn gluten feed. There are also commercial mixes with amino acids that have been protected. Again, in theory these should improve milk production but sometimes we see no response.

There is not much else to inform you about. Basically, the feed companies are selling products with low protein solubilities but no guarantees can be made because we cannot define the conditions that require a low solubility, YET!! The best advice anyone can give at this point is for you to try feeding a "protected" protein source with your feeding program and see if it works. It is impossible to do any damage and you only stand to gain by trying.

BOVINE GROWTH HORMONE

by Professor Elliot Block
Department of Animal Science

Researchers at Cornell University and the United States Department of Agriculture have been investigating the possible uses and mechanisms of bovine growth hormone in increasing milk production in cows. Bovine growth hormone is a hormone that is present in all animals naturally. These researchers found that if dairy cows are given an extra dose of the hormone by daily injections, it can increase milk production by as much as 20 per cent. It seems that this extra dose of hormone causes the cow to shift more nutrients to milk production and less nutrients to body growth.

Since the hormone is a protein (unlike DES which is a steroid) it presents no danger to consumers of

milk because it is digested before it can be absorbed (it is impossible to absorb a protein hormone from the intestine). If proven safe in cows, there are still many obstacles to overcome: an implant or long-term injection has to be developed to avoid daily injections; to date, as this hormone cannot be synthesized in the "test tube" and must be obtained from animals, the massive quantities needed for the dairy industry cannot be obtained; the hormone must be proven safe in heifers and cows, and it must be shown that unnatural levels of the hormone do not appear in milk, and it must be shown which types of animals respond to the hormone.

As can be seen, researchers are years away from making growth hormone a realization to farmers, but it is feasible that the hormone will be marketed within 10-15 years.

Prostaglandins Can Be Used To Improve Reproductive Performance

by Professor B.R. Downey
Department of Animal Science

With the advent of the wide scale use of artificial insemination in dairy cattle, it quickly became apparent that good estrus detection technique was necessary for success. Today, some 30 years later, the ability to detect heat or estrus accurately remains the most important component in proper herd A.I. management. In recent years considerable research effort has been devoted to developing methods of estrus and ovulation control for cattle. Reliable control of estrus could reduce the need for heat detection to certain prescribed days or eliminate the need for observation altogether.

Estrous Cycle of the Cow

During the approximate 21-day estrous cycle, a sequence of ovarian events occurs (see Figure 1) culminating in the maturation of one follicle, its rupture and the release of an ovum (egg), which then passes down the oviduct to make contact with the ascending spermatozoa. Just prior to ovulation, the large maturing follicle produces large amounts of estrogens, the hormones responsible for inducing visible signs of heat and making the cow sexually receptive. Duration of estrus averages 12 to 18 hours with ovulation occurring a few hours later.

Progesterone-secreting luteal cells grow at the site of follicular rupture to form a corpus luteum (CL) and, by day four or five, increasing progesterone can be detected in blood and milk. By day six, the CL is usually palpable per rectum, and this high progesterone (luteal) phase is maintained until about day 17. About this time, a substance called prostaglandin F_2 (PGF_2) is liberated from the uterus initiating luteal regression (luteolysis). Note that if conception has occurred, luteolysis is inhibited, the CL persists, and pregnancy develops.

Following the initiation of luteolysis, progesterone production rapidly diminishes and a new estrogen-producing follicle begins to grow. This follicular phase lasts about three to four days, towards the end of which the cow

returns to heat signalling the start of a new estrous cycle. Elevated plasma progesterone levels during the luteal phase block release of the pituitary hormones FSH and LH, thereby preventing the stimulation of new follicular growth. This same pituitary "block" is in force throughout pregnancy. Since the life-span of the CL, and the progesterone it produces, is the major determinant of the time between heats, attempts to control the cycle have focused on controlling CL function.

Manipulation of the Estrous Cycle with Luteolytic Agents

There are basically two ways by which the cycle can be altered: 1) by inhibiting estrus with progesterone or progesterone-like (progestins) compounds until the CL has lysed naturally, or 2) by causing CL regression with luteolytic agents. To date, two compounds have reached the market in Canada for use in dairy cattle, both of which are available through your veterinarian. They are called Lutalyse® ($PGF_{2\alpha}$) and Estrumate® (cloprostenol, a closely-related

analogue of $PGF_{2\alpha}$) and both act by way of their luteolytic action. A single injection of either of these compounds, given in the presence of a functioning CL (generally between days five and 17 of the estrous cycle, will initiate luteal regression, a rapid drop in progesterone and a return to heat within about 72 hours (see Figure 2). If there is not a functional CL on an animal's ovaries, the compound will have no effect whatsoever.

Management Programs

There are many ways by which prostaglandins may be utilized to advantage depending on your management system. One must remember that PGs will not work if an animal is not cycling and, thereby, will not overcome an already existing problem such as a poor nutritional state. As well, the compounds are only effective between days five and 17 of the estrous cycle, so any program must circumvent this fact. Since it is imperative that a functional CL be present when PGs are used, best results are likely to be achieved if a veterinarian palpates the ovaries of all animals before treatment. As this is not always possible or prac-

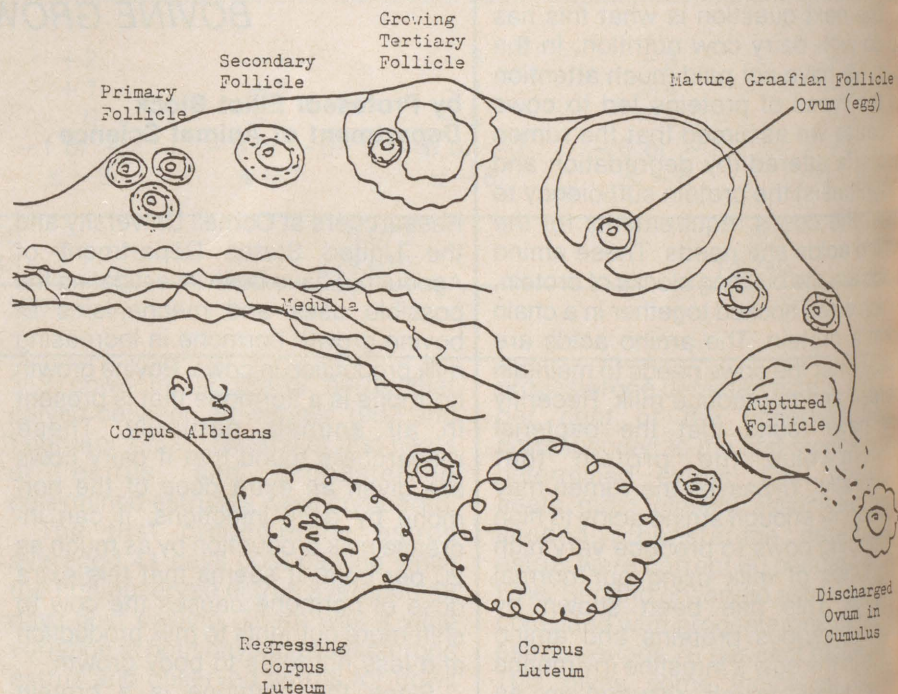


Figure 1. Schematic diagram of a cow ovary showing the sequence of events in the development and rupture of a Graafian follicle and the formation and regression of a corpus luteum.

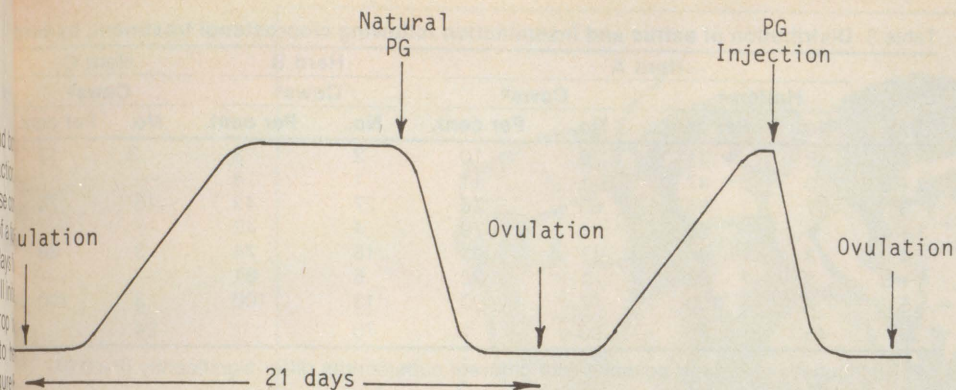


Figure 2. Effect of a single injection of postaglandin on CL function as measured by plasma progesterone.

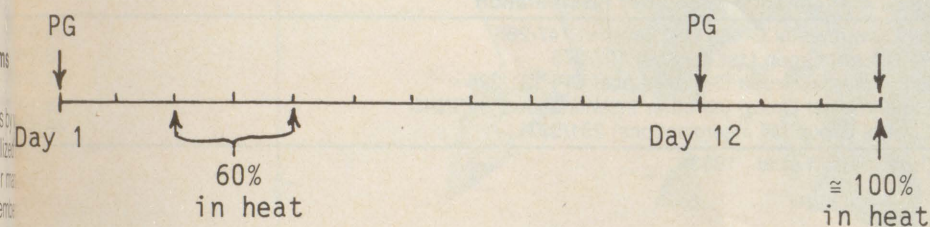


Figure 3. Controlled breeding program in which all animals in a group are injected twice with prostaglandin 11 days apart.

ical, a two-injection method has been suggested which requires little or no heat detection if it is known that the majority of animals are cycling. With this program (see Figure 3), all animals are injected twice with prostaglandin 11 days apart, and fairly well-synchronized heats can be expected three days after the second injection. One has the option of inseminating those animals exhibiting heat after the first injection and re-treating only those which were not bred. Controlled group or batch breeding in dairy animals is likely to be limited to use in heifers,

although the principle of the two-injection method can still be used on individual animals.

Results of a study conducted by Seguin and co-workers at the University of Minnesota were reported recently in the *Journal of the American Veterinary Medical Association* (Vol. 183, pp. 533-537, 1983). Several findings are of practical interest to anyone contemplating using prostaglandins more extensively as a tool in reproductive management.

The PG analogue, cloprostenol, was used in three herds, all with different

breeding programs as outlined in Table 1. Seasonal calving (fall and winter) and breeding (winter and spring) patterns were followed in Herd A. In the other two herds, breeding was carried out year round, with the major difference being the type of housing. Heat checking programs differed among herds, with artificial insemination being conducted six to 12 hours after estrus was first observed.

The experimental protocol was essentially as follows: 1) cows were assigned alternatively to CONTROL or EXPERIMENTAL groups at calving (by age for heifers); 2) all animals (CONTROL and EXPERIMENTAL) were inseminated at their first heat after 55 days post-calving (after 14 months of age for heifers); 3) once each week, EXPERIMENTAL animals not yet bred were palpated, and those with a CL were given cloprostenol; 4) pregnancy checks were done 35-42 days after A.I. and confirmed 21 days later.

Results from all three herds are consolidated in Table 2. First inseminations were carried out 11 and 13 days sooner for experimental cows and heifers, respectively, when compared to the control group. More importantly, days to conception for both cows and heifers were 18 less in the experimental group, which would result in a substantial reduction in calving interval. Of the animals exhibiting estrus between two and five days following cloprostenol treatment (Table 3), the distribution of heats varied between cows and heifers and among herds. For example, the heifers in Herd A came into heat sooner than the cows; as well, the cows in Herds A and C came into heat earlier following treatment than did those in Herd B. The fertility at prostaglandin-induced heats was equal to that at control heats (see Table 4). In fact, the conception rate for experimental animals inseminated between two and five days after treatment was 57.5 per cent as opposed to 46.7 per cent for all inseminations in the control group. This apparently superior performance by the treated animals may actually be due to a concentrated heat-checking effort on the part of the respective herdsmen.

Aids to Heat Detection

Although estrus control may reduce

Table 1. Use of cloprostenol in a reproductive management system for dairy cattle

Herd	No.		Type Barn	Data Included	Heat Check	A.I.
	Cows	Heifers				
A	80	35	Stanchion	3 seasons	8-10 a.m.	2-4 p.m.
B	200		Stanchion	1 yr	1x/day	12 hrs
C	70		Free Stall	1 yr	Several	12 hrs

Summarized from Seguin et al., 1983)

Table 2. Effect of cloprostenol reproductive management system on days to first insemination and conception for cows and heifers

	Cows		Heifers	
	Control	Experimental	Control	Experimental
o. assigned	228	219	51	48
o. inseminated	222	218	51	48
o. conceived	202	197	49	47
Days* to:				
breeding trial	58	58	(14.0 to 14.3 mo)	
first insemin.	81 ± 19 ^a	70 ± 15 ^b	21 ± 16 ^a	8 ± 10 ^b
conception	111 ± 47 ^a	93 ± 38 ^b	38 ± 31 ^a	20 ± 20 ^b

*From last calving for cows and from assignment to breeding list for heifers.

^bWithin categories, means (± SD) differ significantly (P<0.01).

From Seguin et al., 1983)

the need or improve the efficiency of heat detection, careful attention to the problem will still pay dividends. It has been shown that the highest frequency of mounting activity and onset of estrus in post-partum dairy cows occurs during the night (18:00 to 06:00 h). Hence, visual heat checking twice per day in any management system will result in some missed heats.

Heat detection aids such as Estru-mark® or Kamar®, which are placed on the cow to be marked when another animal mounts her, are likely to improve heat checking efficiency. Even better are marker animals such as a bull with a surgically deviated penis, a vasectomized bull, or a testosterone-treated cow or heifer. Such animals will seek out cows in heat and activate the heat detection aid or, if fitted with a chin-ball marker, will mark all animals that they mount.

The accurate detection of heat in cows that are stanchioned (in the winter) and have little opportunity to mingle with other animals can be a great challenge to even the most astute herdsman. Heat detection aids and marker animals may be of little use in such circumstances while predictable timing of heats through artificial manipulation of cycles may make the job substantially easier.

Table 3. Distribution of estrus and insemination following cloprostenol treatment, by herd

Day	Herd A				Herd B		Herd C	
	Heifers ^a		Cows ^b		Cows ^c		Cows ^b	
	No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.
2	18	41	9	10	2	3	3	13
2+3	3	47	1	11	1	4	---	---
3	17	86	60	78	27	43	15	75
3+4	1	88	1	79	4	49	---	---
4	3	94	11	91	18	74	3	88
4+5	1	96	1	92	5	81	---	---
5	2	100	7	100	13	100	3	100
	45		90		70		24	

a,b,c Distributions of data in columns with different superscripts differ significantly ($P < 0.01$). (from Seguin et al., 1983)

Table 4. Pregnancy rates after insemination

All Experimental Group (1st service) 147/266	55.3%
All Control Group (1st service) 127/273	46.5%
Experimental Group (2-5 days post CP) 131/228	57.5%
Experimental Group (all other inseminations) 113/245	46.1%
Control Group (all inseminations) 251/537	46.7%

(from Seguin et al., 1983)

Summary

When prostaglandins are used in "normal" cycling dairy animals (nutrition and health are assumed to be optimum), the majority of heats occur within a few days of injection. This should enable herdsmen to concentrate on, and thereby improve, the efficiency of their heat checking efforts. Since fertility following

prostaglandin treatment is good, you should be able to shorten the calving interval in your herd with their judicious use. Once you understand the mechanisms involved in estrus control with prostaglandins, the ways of using these products to benefit your particular breeding management system are limited only by your imagination.

Canada's Holsteins

by Peter Lewington (350 pages)
Publisher: Fitzhenry & Whiteside

195 Allstate Parkway
Markham
Ontario L3R 4T8

Price: \$40.00

«Canada's Holsteins» is a fascinating history of the breed from its introduction in 1881 to the present day. This is one of the greatest success stories in Canadian Agriculture and how it came about. The 26 chapters are all about the people, the policies, the cows, the bulls, and the organizations that were involved in the development of the breed. In the way the text is presented, it is an excellent history of Canada's dairy industry which the Holstein dominated in the last half of this past century.

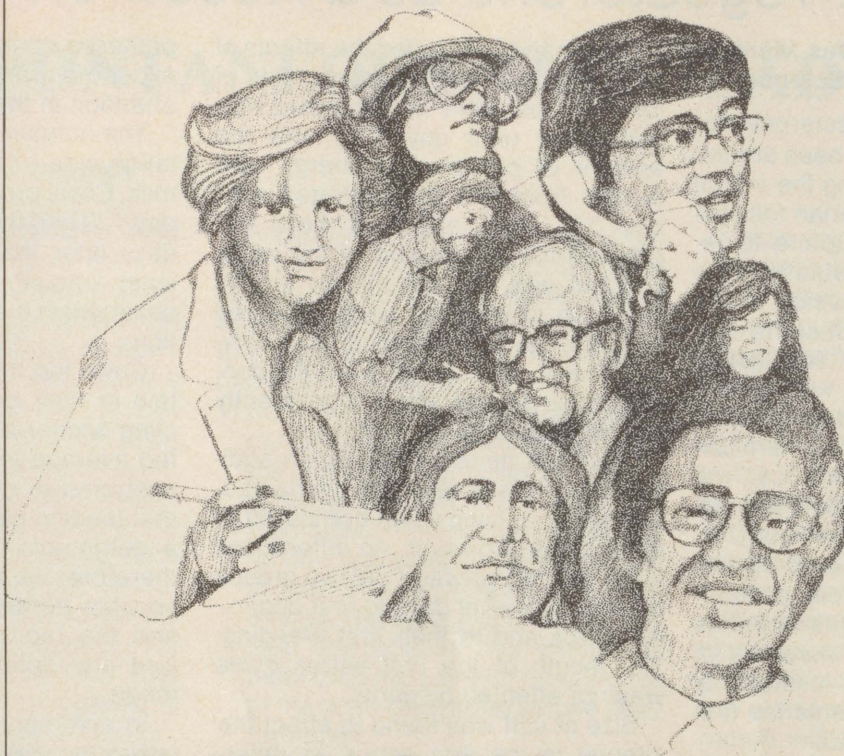
CANADA'S HOLSTEINS

Peter Lewington



While wheat may be our biggest agricultural export, Canada is best known in agricultural circles around the world for its Holsteins. There are threads of the interchange of Holstein breeding stock between Canada and the United States throughout the text. Four chapters deal specifically with the success of Canadian Holsteins in other continents.

The author, Peter Lewington, earlier a successful Holstein breeder, is best known for his ability to interpret and present agricultural topics in a clear, concise and very readable manner. The book reflects his thorough research and his personal observations of Canada's Holsteins in Canada and the world as a writer over the past third of a century. The book is interesting reading and well documented with photographs. It should be of interest to Holstein breeders and anyone interested in a Canadian success story.



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Milk Progesterone as a Research Tool

by B. Rutley & Sylvie Des Marchais
Department of Animal Science

The use of milk progesterone for reproductive studies has been around for about 20 years. During the estrus cycle of the cow, the ovarian follicles reaching maturity will rupture to release the ovule. After ovulation, the ruptured follicles will develop into a corpus luteum (C.L.) which starts secreting progesterone. If fertilization has occurred, the C.L. will remain present on the ovary and continue to secrete progesterone. If no fertilization has taken place, the C.L. will regress, progesterone levels will decrease and a new cycle will start.

Much has been discovered regarding the reproductive cycle postpartum. However, most of this work has been done using small numbers of cows or has involved institutional herds. This study represents the first work on commercial herds.

Thirty-two DHAS official Holstein herds were selected for extended progesterone (P_4) sampling. For the study 353 cows calving between November 1982 and February 1983 were selected based on their sire. The purpose of this research was to determine the factors affecting early P_4 measures of the reproductive cycle. Milk samples were collected three times a week (Monday, Wednesday, Friday) and assayed for progesterone. These results were then merged with the DHAS files, and clinical conditions that could affect a cow's performance were obtained from the producer.

The time of the first ovulation (OVI) after calving was determined as being five days before P_4 rose to a level indicating luteal activity and stayed elevated for a minimum of two samples. Progesterone estrus (PEI) was defined as the first day that the level of progesterone decreased below 5.9 ng/ml of milk indicating the follicular phase. The length of the first cycle could be determined two ways: (1) the number of days between the first ovulation and the first P_4 estrus (PE1-OV1) and (2) the number of days between the two subsequent ovulations (OV2-OV1). Averages for these measures can be found in Table 1 and a profile for progesterone secretion is seen in Figure 1.

The analysis included the effects of herd, month of calving, parity, size of calf, four per cent fat corrected milk cumulated until day 120, and the amount of protein and energy consumed from the concentrates until day 120. The effect of herd accounted for a large part of the variation but was not statistically significant. No differences were observed between the different months of calving. The level of energy from the concentrates did not affect significantly the return to ovarian activity.

First calf heifers required an additional 10 days to return to ovarian activity after calving when compared to older cows. However, no differences were noticed between the two groups for the number of days to first observed estrus and to their first breeding. The length of the first estrus cycle was not affected by parity.

Size of calf was found to affect the interval to the first estrus as determined by the level of progesterone in the milk, and cows bearing small calves required an additional 10 days to first P_4 estrus. It was hypothesized that it was probably not due to the small calf having a direct effect but to indirect effects of different factors that could be of a nutritional or of an hormonal nature. However, these hy-

potheses could not be verified in this experiment and should receive more attention in the future.

The number of days to second ovulation was affected by fat corrected milk. Cows producing the most milk at day 120 had their second ovulation 14 days later than cows producing the least amounts. No differences were observed in the case of the first ovulation.

Cows fed the highest levels of protein in their concentrates began cycling sooner after calving than those fed average levels. It has been demonstrated in other studies, however, that feeding high levels of protein has a detrimental effect on conception; therefore, we need to study the relationship between early P_4 measures and the reproductive measures before any definite statement can be made.

In summary, we can say that the return to ovarian activity after calving was affected by herd, parity, size of calf, fat corrected milk, and the protein level in the concentrates. Month of calving and the energy level in the concentrates had no influence. Other unidentified factors may also be present, and this study is continuing in a hope to shed more light on many of the unanswered questions.

Table 1. Averages of early progesterone measures

Progesterone measure	No of cows	Length (days)	Range (days)	Most freq. measure (days)
Days to first ovulation (OV1)	203	23	3-68	15
Days to first P_4 estrus (PE1)	184	41	14-94	37,44
Days to second ovulation (OV2)	167	46	14-95	37
Length of first estrus cycle				
PE1-OV1	181	18.5	7-49	12
OV2-OV1	167	24	8-47	21

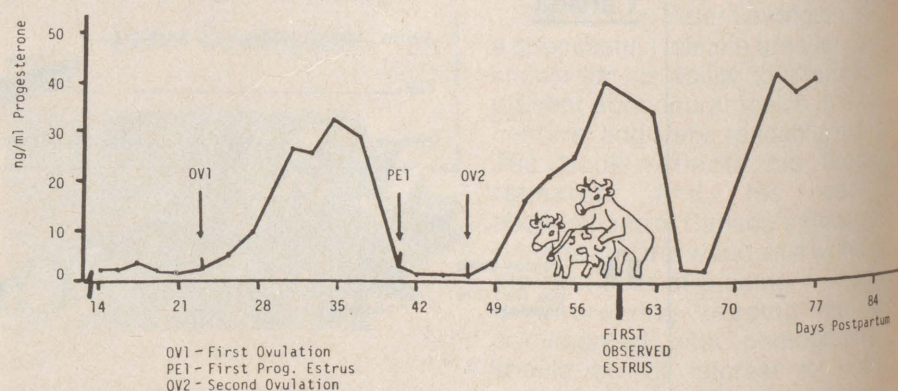


Figure 1. Hormonal activity versus external reproductive activity.

SPONTANEOUS AND DEADLY

by Professor Elliot Block
Department of Animal Science

Imagine your prized cow producing almost 45 kilograms of 3.8 per cent fat milk per day just before peak lactation. You look at her wishing that you had an entire herd like her. She is consuming feed quite normally and appears content. Suddenly, she drops her milk production to 15 kilograms per day, stops eating, and dies two days later.

Believe it or not, this occurs (except the death) in 15 to 25 per cent of the dairy cows in North America with death resulting in 35 to 40 per cent of the cows affected. Needless to say the economic loss of milk and possibly the animal herself represents a major cost to the dairy industry. The disease is called "spontaneous bovine ketosis" and usually occurs in high-producing cows in early lactation.

The development of bovine ketosis is still a mystery to science. Animals other than cows can develop ketosis. Animals (including humans) that are starved for long periods of time mobilize body fat reserves at a faster rate than the body can utilize the fat resulting in "ketone body" formation which, at high enough levels, are toxic to the animal. These ketone bodies are B-hydroxybutyrate (BHB), acetoacetate, and acetone. In cows, however, the ketosis develops spontaneously; the cows are not starved and, in fact, are usually consuming feed normally, but the ketone bodies form spontaneously at high levels. This results in the cows refusing to eat. After the disease develops and milk production drops. If untreated for a long period of time, (one to two days) the cows will die.

We do know that one of the causes of the disease is hypoglycemia (low blood sugar) that also occurs spontaneously even though the cows are consuming feed. One of the treatments, therefore, is to give glucose intravenously. Other symptoms of bovine ketosis are sweet smelling breath (caused by acetone), derangement, and excessive urine production caused by the elevated blood ketone levels).

Although we know very little about the mechanism(s) involved in bovine ketosis, we do know of some factors associated with its onset and possibly why they contribute to the development of the disease:

- 1) Cows that come into lactation over-conditioned (fat) are very prone to the disease. Fat cows almost always eat less feed in early lactation than cows in proper condition. If a fat cow is producing high quantities of milk, she requires quite a bit of energy. Because she is eating less feed she obtains this energy by mobilizing her plentiful fat reserves to the point of causing ketone body formation.
- 2) Excessive overfeeding or underfeeding of protein during the dry period or in early lactation predisposes cows to bovine ketosis. Certain amino acids (the building blocks of proteins) are ketogenic; they cause the production of ketone bodies. Therefore, overfeeding of protein can cause ketosis. On the other hand, when we underfeed protein the body responds by mobilizing fat reserves also causing ketone body formation and possibly ketosis.
- 3) Silages that did not ferment properly contain high levels of butyric acid, which in turn causes ketone body formation in cows.

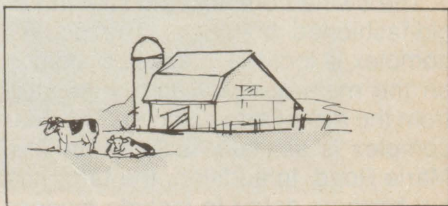
A cow can get a mild case of ketosis where she drops some in milk production and consumes a bit less feed. To test if this is ketosis there are "dip-sticks" available. These sticks are a little larger than a toothpick and when drenched with a cow's urine will change colour. The colour that develops will tell you if there are abnormally high levels of ketone bodies in the urine. The only fall-back to this diagnostic tool is that if cows are consuming silage as the only forage, the cows may show a positive urine test for ketosis but in actuality do not have the disease. This is because some of the acids in silage are excreted in urine and react with the "dip-stick" to give a false positive test.

Once you recognize that an animal has ketosis the treatment is to administer a glucose solution intravenously (obtained from your veterinarian) in severe cases. In milder cases your veterinarian may supply you with propylene glycol (similar to car antifreeze) to give intravenously or in the rumen. Propylene glycol is a precursor of glucose in cows and can act as a longer-term treatment than intravenous glucose; however, in severe cases glucose must be administered. **Do not** try to increase blood glucose by feeding the cow "sweets" such as molasses. Although this would work in humans the cow's rumen will ferment the molasses to acids that will worsen the problem.

The only preventative "medicines" that can be offered at this point in time are the following:

- 1) Do not allow cows to become fat during the dry period. Grain intake should not exceed 0.5 to 0.8 per cent of body weight per day. Corn silage is high in energy and may have to be restricted for feeding to dry cows. If the dry cows are too thin, by all means get them to their proper weight but not overweight.
- 2) Check that your dry-cow ration and your ration for early lactation cows is not excessive or deficient in protein.
- 3) Avoid the use of mouldy, hot, or otherwise badly fermented silage for all animals, especially dry cows and cows in early lactation.

These three simple procedures can save you from suffering the economic losses and psychological stress associated with our mysterious disease, spontaneous bovine ketosis.



DEVELOPMENT OF LIVESTOCK AND POULTRY FACILITIES

by Dr. R.B. Buckland
Chairman, Department
of Animal Science

It is with great pleasure that we take this opportunity to provide you with a brief outline of the plans we are developing for our new and improved livestock and poultry facilities at Macdonald College. In a future issue of *The Macdonald Journal* we will be providing more details including a layout of the farm site showing the size and location of the new facilities. At the present time, the overall plan is in its final stages and cost estimates are being prepared. In developing these plans input has been and is continuing to be solicited from a wide variety of individuals and organizations. Included in this have been visits to a number of modern research and teaching facilities and more are planned as we progress with developing the details of the plans. These activities are the responsibility of a Project Group which has been established by the University. The Project Group includes representatives from the Faculty of Agriculture, the Director of Physical Plant, and the Director of the Office of Physical Resources.

The development of the Macdonald College Farm dates back to the beginnings of the College itself in 1907. At that time, Sir William Macdonald, benefactor of the College, purchased the Reford dairy farm to establish practical farm facilities for animal husbandry. Within a few years, the College had developed a significant herd of cattle as well as swine and sheep and flocks of various types of poultry.

Today the Farm remains an integral part of both the Faculty's academic program (teaching and research) and the local community. Over the years, due to limited capital resources, the farm facilities have become out-dated and inadequate for modern farm functions. The cattle complex dates back to 1910.

The swine complex is dispersed in old-fashioned buildings. The poultry complex is located in seven buildings on the main campus and is isolated from the main Farm complex. The beef complex is similarly isolated on Ste. Marie Road. In addition, the farm has not been up-dated to include modern

farm methods, in particular the handling of animal waste.

Objectives

The Macdonald Farm, therefore, requires a major modernization and redevelopment program. The objectives of this program are as follows:

1. to provide a modern farm facility, suitable for the teaching and research needs of the University and the community well into the 21st century;
2. to provide facilities that: 1) meet current animal care requirements and future requirements which are being developed for each species; 2) meet recently introduced legislation regarding the handling of animal waste; 3) maximize labour

efficiency, and 4) keep maintenance costs to a minimum.

Funding

The funds to support the development of the livestock and poultry facilities will come from three sources: 1) the McGill Advancement Program, 2) additional donations from private and industrial donors, and 3) from the Government of Québec.

Development Program

The development program consists of new construction, renovation, and demolition projects. A brief description of each project follows.

a. Cattle Complex After detailed study, it was decided that it was not



MACDONALD DIJAX MITZI AMY

Gordon Beaulieu, Herdsman at the College Farm, said recently that "Amy is our pride and joy at the present time. Amy is a Roybrook tempo daughter who classified for type very good as a two-year-old and again as a three-year-old. She is not only very easy to look at but her production is high. As a two-year-old she produced 8,249 kg milk, 337 kg fat, 4.09 per cent test, for a BCA of 188-208. In her present lactation she has a projection

of 9,996 kg milk, 348 kg fat, for a BCA of 207-196.

"Amy started drawing people's attention as a calf in the students' Royal," Gordie continued, "and has since travelled from Victoriaville to the Royal Winter Fair in Toronto. She has always placed in the top half of her class. Her mother, grandmother, and maternal sister have all done well for us at Macdonald. Amy combines type and production.

feasible to renovate the existing cattle complex for the dairy herd due to the physical restrictions dictated by its current dimensions and the requirements of up-to-date waste and feed handling. Therefore, it is proposed to construct a new modern cattle facility on a site immediately west of the existing building. This facility (approximately 3,200 square metres) will include a dairy barn, calving area, cattle replacement wing, cattle growing area, feedlot, hay barn, silos, feed mixing area, and modern manure handling facilities. The existing cattle complex will be renovated to provide facilities for Soil Science and machinery storage. The distinctive octagonal "show ring" will be retained and used for teaching and special animal shows such as the annual College Royal.

To make way for the cattle complex, the horse barn now used by Wildlife will be demolished and research facilities for the Wildlife program will be developed near the Arboretum.

b. Swine Facilities The swine facilities will be consolidated into one complex

to reduce maintenance and labour costs. As a result, new construction is required (1,500 square metres) to provide space for sows, weaning areas, and research as well as modern manure handling facilities. The existing pig growing barn (470 square metres) will be completely renovated to become part of the complex. The "old piggery" facility (1,800 square metres) will be demolished except for the south wing which will become part of an effort to consolidate the sheep flock in this area.

c. Poultry Facilities All new poultry facilities will be relocated north of the railroad tracks as part of the main Farm complex. It will be consolidated into one facility to reduce maintenance and labour costs. The new construction (2,800 square metres) will include modern cage areas, environmental rooms, feed storage, incubators, and manure handling facilities. The facilities will provide areas for both teaching and research. The existing poultry facilities will either be transferred to other research units or demolished.

d. Miscellaneous Projects

- i. Animal Research Unit — A new metabolic facility for intensive physiological studies on domestic animals will be installed in the existing building. An animal holding "butler" barn currently being used to hold overflow animals from our dairy herd will be relocated and attached to the Animal Research Unit to complete the consolidation of the sheep flock in this area.
- ii. Animal Slaughter Facility — A new animal slaughter facility will be built onto the west end of the Farm Centre.

Conclusion

These plans represent an ambitious project for the re-development of the Farm area and are viewed as a master plan for our livestock and poultry facilities. Since it is a major project, it will take time to complete as it can only be done as the money becomes available; however we hope to see it completed by 1990.

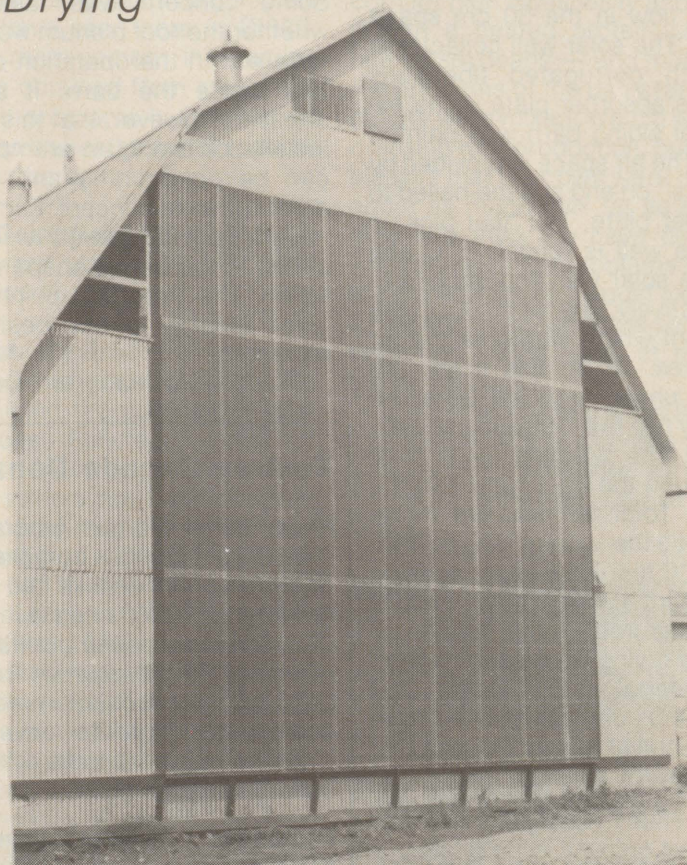
A Solar Barn for Hay Drying

by Christopher Stratford
Brace Research Institute

The advantages of using electrical fans for drying hay inside the barn have been recognized for the past 40 years. Among these are: up to 25 per cent fewer leaf losses in the field; less damage to the crop by the ultraviolet rays of sunlight; better harvesting and labour management on the farm, and less risk of having the crop rained upon.

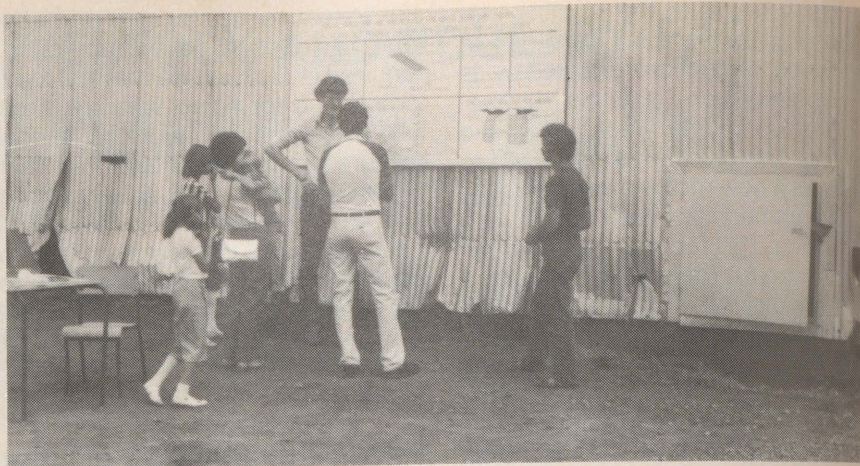
Hay drying systems in the 1950s used fuel burners to heat air which was blown through the wet hay. This, however, resulted in a serious fire hazard and consequently forced ventilation systems were developed to dry the forage.

The use of artificial ventilated hay dryers using ambient air has been quite popular in Quebec where there have been an estimated 10,000 units sold since the 1960s. To date none of these dryers have capitalized on the use of solar energy to heat the drying air.



Under an Agriculture Canada grant, the Department of Agricultural Engineering and the Brace Research Institute at Macdonald College have developed and tested a 50 square metre solar wall air preheater combined with a 190 square metre roof plenum preheater at the College Farm. The system was essentially designed to be simple, inexpensive, owner-built, and capable of being retro-fitted on existing metal-sided hay barns. The components of the system are: a roof plenum air preheater; solar wall and back-pass wall; mixing plenum; fans and air ducts underneath the hay stack. Ambient air enters the barn through openings on the north side and is heated by solar radiation striking the galvanized roof. The floor of the roof plenum preheater is made of a 300 square metre sheet of polyethylene separating the drying air from the humid barn air. The air travels through this plenum preheater at about 2.5 square metres along the 27 metre barn length and picks up between 2.0 and 2.5°C. The air is then divided between the solar wall and back-pass wall in order to accommodate the large operating flow rates. About 250 cu.m./min. flow through the 18 cm air space of the solar wall, while 500 cu.m./min. flow in the 30 cm space back pass. The solar wall collector is glazed with corrugated fiberglass sheets. The absorber plate is the existing metal siding barn wall painted flat black. The air space is provided by two "2 x 4's" on end and toe-nailed to the absorber plate. The heat pick-up through the wall is roughly 5°C and 1°C for the solar wall and back-pass wall respectively. The air mixes in the floor plenum which stabilizes the air temperatures. Up to this point, the system is under negative pressure powered by two five horsepower electrical fans. The warmed air is then blown through the ducts and into the moist hay. Total temperature increment through the system ranges from 3.5° to 5.5°C for global solar radiation levels of about 450 to 600 Wh square metres, measured on the horizontal. Quantitative drying studies are currently being undertaken to evaluate what energy savings can be obtained from the system. Initial results indicate that electrical energy savings between 20 and 30 per cent are possible with this system.

The idea of integrating a solar col-



Using the wall of the solar barn for display material, Christopher Stratford describes the research to visitors at last fall's Farm Days.

lector into a barn is a relatively simple technology. Farmers could build such systems themselves during the less productive agricultural periods. The solar barn can be used as a multi-purpose heat generating structure channelling low grade heat to different areas of the farm, wherever needed.

During last fall's Farm Days at Macdonald, many farmers expressed interest in this new approach to hay drying. One of the main attractions of the system was the ease of construction and the simplicity of the design. Some concern was raised as to whether the roof plenum would not interfere with the operation of the hay fork inside the barn. It should be stressed, however, that this particular installation is only an example of what can be constructed and serves to demonstrate a concept. Each barn will have a specific design which is best suited to the barn's shape and orientation. The important point is to use solar energy to our best possible advantage.

Plans were made to use the heat

from the solar barn at the Macdonald College Farm for nearby grain drying operations during October when the hay drying operations would be completed. With pay back periods below three years for ventilation applications, large scale owner-built solar walls in Canada are becoming a viable option to conventional energy usage in agriculture.

In the long run, the resulting savings in feed consumed, the higher quality and quantity of forage produced, and the improved labour management due to greater ease in harvesting the forage contribute to the success of this system.

Finally, it is evident that the use of solar energy, though important, is only one element in the overall Appropriate Technology developmental process which can be adopted to enhance feasible farm operations.

The author wishes to acknowledge the contributions of P.J. Jutras, Professor at the Department of Agricultural Engineering, T.A. Lawand of the Brace Research Institute, and R. Chagnon of Agriculture Canada.

Textron Canada Donation to the Morgan Arboretum

Recently the Morgan Arboretum Association received another in a series of special contributions from the Textron Canada Charitable Foundation. Mr. Michel St. Aubin, President of the Homelite-Terry Division of Textron Canada Ltd., delivered a \$4,000 cheque in support of the Association program. This generous donation is a special contribution in addition to the long-term assistance received by the Association from the Homelite-Terry Division. The company has provided the Association with an assortment of Homelite chainsaws and other equipment on loan for several years.

The Morgan Arboretum Association is deeply appreciative of this generous and sustained support.

Professor J. D. MacArthur
Curator, Morgan Arboretum

Prof Profile

For this profile of Professor Elliot Block of the Department of Animal Science, Norman Campbell, who as Manager of the Dairy Herd Analysis Service (DHAS) is very in tune with the dairy farmer of Quebec, his needs, his problems, and his accomplishments, conducted the interview.

Norman Campbell How does a young fellow from Brooklyn, New York, wind up working in ruminant nutrition in Quebec?

Elliot Block It might be hard to believe, but at first, I wasn't even going to go to college! I went to work after school and then decided to take biological technology at night school. I had to take an animal nutrition course, and before I knew it I fell in love with the subject. After about a year of night school, I went to Columbia University and started in a math program but realized that wasn't for me. I finished my biological technology degree and transferred to Cornell University. Prior to this I had worked on some farms in the New York City area, but they were mainly duck and potato farms and I didn't like them. I now got work on a few dairy farms and once again I fell in love with them and continued on for my animal science degree. From there I was totally enthralled with animal nutrition, specifically dairy. I continued to work on dairy farms and even got to be herdsman on one farm.

I went to the Pennsylvania State University for my Master's degree in dairy cattle nutrition and immediately after that degree I was asked to go on for the Ph.D. which I completed in June of 1980. At that time I started looking for a job. During my graduate career I was interested in and involved with student activities and teaching, and I took quite a few education courses. I decided I wanted to keep on teaching, to do research, and to stay in the Northeast as it is close to home. Among the answers to my application was one from Macdonald. When I inquired about the type of farms, the teaching and research opportunities that were available, it turned out that the job that suited me best was here, and I have no qualms about coming here.



Norman Campbell, left, found that Elliot Block is a professor who is very concerned with problems facing dairy farmers.

Norman Campbell Since dairy herd improvement (DHI) work is a particular interest of mine, I know that Penn State is very actively involved in the DHI program. Did your research work involve you with the DHI program?

Elliot Block Most of the work from the DHI program was directed toward the geneticists — there was very little work on nutrition. It was difficult to obtain records out of the DHI files, and their records are not quite as complete as what I have seen here in DHAS. Nutritional management information that can be obtained from any of the States' DHI programs is very limited and that was one of the major reasons why I came here.

Norman Campbell What specific research were you doing for your Master's and Ph.D.?

Elliot Block My Master's research was directed toward calf nutrition. We were examining the concept of total mixed rations. Pelleted rations for calves were gaining popularity but neither my advisor nor I was convinced that this was necessarily the way farmers should go with their newborn calves. We had a hay shortage due to drought at the time and we were also looking for alternative sources of feed, including rations with corn silage and wood pulp fines. It was a long trial and the results were relatively surprising. We found that the pelleted ration was not very good for the calves at least from birth through 36 weeks. The wood diet was excellent. The calves had phenomenal growth rates and were

not getting too fat. We found that until their rumens were developed that calves didn't do well on the corn silage ration.

At the time I started my Ph.D. trial the concept of heated protein or protected protein was gaining in popularity and I wanted to look at that for lactating dairy cows. We had developed a corn cultivar that contained a low quantity of lignin which inhibits digestibility. We decided to grow this corn for high digestibility and combine it with a heated protein source — heated soybeans — and thus solve all the problems of the dairy farmer! Our results were mixed. We did wind up increasing milk production, but the trouble was that the cows were producing about as much milk fat as is in skim milk. We think we have determined what some of the problems were and in the near future I would like to start a trial and try to duplicate some of this research, taking some of these problems into account.

The problem with the low lignin corn was that there was also less yield, and it just wasn't profitable for the dairy farmer to grow this type of corn for silage.

Norman Campbell I find that an interesting statement because there is a great deal of research done that is directly applicable to the farm and yet the economics of it are often not looked at.

Elliot Block Although I am also doing purely basic research, I feel I must ask the question: "is it going to help the farmer eventually," and unless you

can turn the results of the research into dollars and cents, it means nothing to the dairy farmer.

Norman Campbell *In the 17 years that I have worked in the farm management area if I were to suggest a major problem in dairy farming in Quebec, it would be that farmers have not paid enough attention to growing out their heifers. Many heifers are not achieving breeding weight early enough, they are calving at too light a weight and consequently there are many small animals. The situation is improving but it has been a problem over the years.*

Elliot Block Since I have been in Quebec I have not done any research on calf nutrition. In my short time here I have been out to quite a few farms and I have seen the two extremes. I have seen the very thin poorly grown calf and I have also seen the extremely fat calf and neither condition is desirable; both will hurt the animal's eventual milk production and reproduction performance. We are about to start a project on determining some factors related to calf mortality. Although people suggest a figure of a 10 per cent loss of calves, I think that it is more likely a 45 per cent or higher loss if you include the males as well. Unfortunately, the traditional sources of research funding tend to shy away from large-scale surveys and there is no place else to start.

A problem I see is that dairymen are trying to grow all the females that are born on the farm. It is difficult to pay the type of attention that the dairyman should to growing an animal if he has 50 heifers between birth and a year old and then another 50 heifers between one and two years old. It is hard to group them and feed them properly to get them to the correct size. The farmer is not going to use those 50 heifers that are between one and two years old in his herd so why does he bother keeping them. There is certainly enough information through their own or DHAS records to know exactly what kind of calf they are going to get. Why not get rid of those extra calves early and concentrate on those animals that should be kept?

Norman Campbell *What do you think are the major problems on Quebec dairy farms that with research you might be able to do something about?*

Elliot Block Milk fever is still a problem even though we have known about it and known how to prevent it by various methods since the late 40s. (Macdonald Journal, August, 1983.) There are two types of farmers: those who don't know how to prevent milk fever and, therefore, have a problem and those that know how to prevent it but can't because of their specific situation. They live with it. It is mainly those farms that have to live with the situation that I am trying to help now with trials on milk fever.

The other area that we are working in is the parasite problem (Macdonald Journal, February, 1983.) We have an unseen problem; there are no clinical symptoms in the animal. The animal is eating well and looks as if it is growing all right, but the farmer might be losing as much as 10 to 15 per cent in milk production simply because he doesn't know that the parasites exist. These parasites are acquired in an animal through summer pasture — even in a loafing lot if there is grass in it. We are currently analysing the data from a trial where we used 100 of the highest producing DHAS farms. There has not been one single farm that I have taken a sample from that has not had parasites show up in various degrees — from a low to a medium high level. There were 500 cows sampled every other week for four months and everyone of them had problems although none was clinical.

Norman Campbell *Do you work with some of the companies that might provide treatment?*

Elliot Block That is mostly where we get our money from. There are at least 100 products on the market that the farmer can buy in order to get rid of parasites. Our research is not to show that a particular product is going to get rid of parasites. We know that. Our question is does it pay the farmer to get rid of parasites? Are we going to stimulate milk production to the level that it will at least pay for the product that the farmer purchased? The other question that we are asking is when is the best time to treat the animals. Are we going to get the maximum benefit from treating them at calving or should we treat them before and after the pasture season?

Another problem that I see in the en-

tire northeast including Quebec is forages. Farmers notoriously cut forages when the weather is right and they can get in a good crop. Few farmers really pay attention to the quality of that forage. I don't think most of them realize that they could be purchasing a 14 per cent grain mix for their dairy herd rather than an 18 per cent grain mix if they got the hay cut two weeks earlier than some of them do.

Norman Campbell *Farmers have advanced in that area in the last 15 years, but you feel there is still room for improvement.*

Elliot Block Yes. The past two summers have presented problems with low quality forages because of the weather. Gene Donefer and I are doing research to see if we can improve the value of low quality forages by mixing them with high quality forages. A farmer may get one field of high quality alfalfa hay cut but two other fields have gone past the stage of being classified as high quality. We are looking at different methods of combining those forages to see if we can possibly improve their quality.

Norman Campbell *The reality of the situation is that due to climatic conditions the farmer does end up with some low quality forages.*

Elliot Block This is one of the reasons why more and more silos are going up around the province because the weather conditions are much less critical in silage making than they are in hay making.

Norman Campbell *It is also a little easier to handle with the labour available on the farm.*

Elliot Block Another area of research that we are working on is protected protein or heat-treated protein for lactating cows. We are also doing a project on the feeding of buffers.

Norman Campbell *I think that DHAS has been an example of the positive thinking that can happen when a DHI program is run in conjunction with a teaching or research institution. Some people suggest that this type of program could be run totally divorced from teaching and research, and that we could make these data available to*

you. Knowing of the development of DHI both in Canada and the U.S. — in Penn State, Wisconsin, North Carolina, and Cornell — I would say there is a good indication that the closer DHI is allied to teaching and research the better it functions.

Elliot Block The DHI system could probably work by itself away from a university, but I think that it would be a very bad thing. Most DHI programs were developed by university people. The concept of DHI or DHAS being removed from the university would slow its advancement tremendously. There is a lot of improvement that still can be done and in order to do so dialogue between the people at DHAS and the Animal Science Department is necessary.

Norman Campbell You've been here for three years working in the Quebec environment. How do you like it?

Elliot Block I feel excellent about it. Living in Ste. Anne's we have the best of two worlds. Montreal is some 20 kilometers away, and I think it is a wonderful safe city which is something I am not used to. I'm also close to the farmers and close to the country.

Norman Campbell What are your interests once you close the door in the Animal Science Department?

Elliot Block One thing that my wife Bobbi and I love to do is eat and we chose the perfect city for that. Bobbi is taking French courses in Montreal learning French is not a problem for us; it is a challenge. In New York I used to hear Spanish, German, Italian), and I meet her once a week to try a different restaurant. We are big movie goers and again the opportunities are excellent as they are for the theatre and other areas of night life. Although he is from Philadelphia, Bobbi prefers the rural life style. She has a degree in animal science and occasionally works on special projects for our Department.

Norman Campbell Have you noticed in the last few years the tremendous number of urban raised people who are working in agriculture and vice versa?

Elliot Block I find it interesting. I also

feel that it can serve to benefit the farmer. When I was at Cornell there were quite a few students from farms, and it was difficult for them to make it through not because their intelligence level was any less than anybody else's but they had inbred ideas of exactly what it should be like on the farm. "Dad, granddad, and great granddad did it this way and here is this guy standing in front telling me that they have done it wrong!" The city person who has a true interest — and I mean more than just going to school because I don't think that an undergraduate student should get through an animal science program without working on a farm for at least 400 to 800 hours or two summers — can contribute to agriculture.

Norman Campbell We have some excellent staff working with us who have urban backgrounds. They do very well in agriculture, and I think the major reason is that they are completely unburdened by past traditions.

Elliot Block Farmers are open to suggestions, particularly if they know they have a problem. Some do not know. For example, there are some farmers who have an average milk production of 5,000 to 6,500 kilos per cow per year and are quite content. They are making a living, meeting their quota and, therefore, are not interested in improving production. What some do not realize is that by increasing production of all their cows by 100 kilos a year, they can get rid of one cow. This would eliminate several things: the cost of raising and maintaining the animal, as well as less veterinarian bills, less housing, less ventilation, and less vacuum requirements on the milkline. Big is better according to many farmers and it's not necessarily true.

Norman Campbell While one could argue both the good and bad points of a quota system I think it has increased the openness of farmers to explore some of these areas that you are talking about because the openness of the farmer to new ideas is often dictated by economic realities and the quota system and the high price of acquiring more quota is an economic reality.

Elliot Block Yes, more so here than in the States where many milk processing plants are closing down,

farmers are going out of business, and the price support is being cut. And there is still a surplus! Farmers see a 50-cent cut in milk and buy more cows, which is exactly opposite to what the government wants.

Norman Campbell How do you find funding for research in Canada compared with the U.S.?

Elliot Block In the U.S. each State allots a certain amount of money to the university for research. From there the different departments decide where the money will go. Here we rely upon our granting capabilities. We write for a grant and we either get it or we don't. My Ph.D. project at Penn State was partially funded by private industry. My impression is that private industry here will willingly fund specific projects that will stand to benefit them for a particular product but they will not necessarily do anything for the general sake of research which is dictated by present economic times.

Norman Campbell Are you enjoying the teaching here?

Elliot Block I love teaching. I enjoy the students and the contact with them keeps you feeling young. I am more involved with teaching and research than I am with committees, but I do enjoy the High School-CEGEP Liaison Committee and the Rural Extension Services Committee.

Norman Campbell One of the problems with research is being able to communicate the results to the rural community. Do you see that as a problem here?

Elliot Block Yes, a tremendous problem. In the States the county ag rep is closely allied to the university. The universities have extension specialists who do nothing but extension; they transmit it to the farmer. I feel that we in Canada have little communication between the universities and the ag reps. The organizational structure at the provincial level is at fault but could be remedied by having people housed at or between universities.

Time permitting, I do enjoy getting out to speak to farmers because that, too, is another way in which I can discuss my research and also find out what the problems are out there.

Nutrition Research and Public Information

by Dr. T.K. Murray

There are a number of aspects of nutrition research and public information on which I would like to make some general comments; as well I would like to deal with the relationship between research and the nutritional guidance provided Canadians through public health programs.

First we should seek assurance that good nutrition is necessary for good health. Certainly an adequate intake of calories, water, vitamins, and essential minerals is absolutely essential. Canadians, however, are among the favoured few who have so much food that most can focus their concern on the choice of food — a luxury known rarely, if at all, by most world inhabitants.

We are further blessed with a health care system that gets most of us safely through childbirth and prevents or lessens the effects of infectious diseases. One result of this good fortune is that we are available for the onslaught of the chronic diseases, some of which kill us directly, some of which contribute less directly to our death, and some of which simple plague us until death.

Naturally we want to know if our choice of foods in any way contributes to our susceptibility to these diseases. The answer is yes. There is evidence of varying degrees of persuasiveness, for a relationship between diet and cardiovascular disease, hypertension, some common types of cancer, dental caries, osteoporosis, and a number of other diseases that kill us, set us up for the kill, or blight our lives. Now there is no consensus on how we wish to die — at one time most men voted to be shot at the age of 100 by a jealous husband, but many now favour being wounded at the age of 100 by a jealous husband. Since we can't agree on a favoured cause of death, it would be prudent to adopt dietary habits that will not lead to heart disease, cancer, or any other rotten nutrition-related diseases. Public health programs aim



Dr. Sherman Touchburn, left, Dr. and Mrs. Murray, and Dr. L.E. Lloyd discuss the Crampton Lecture. Of additional interest: Drs. Murray and Lloyd were classmates.

DR. THOMAS KEITH MURRAY

The 1983 recipient of the Earle W. Crampton Award for Distinguished Service in Nutrition was Dr. Thomas Keith Murray, Executive Director of the Human Nutrition Research Council of Ontario.

Dr. Murray was born in Scotsburn, Nova Scotia, and is a Macdonald graduate — B.Sc. (Agr.) '48, M.Sc. (Agr.) '50, Ph.D. '57. From 1948 to 1978 he was with the Department of National Health and Welfare's Food and Drug Laboratories. Dr. Murray conducted and directed research on a variety of nutrition problems. In 1966 he became Chief of the Nutrition Research Division and in 1974 he became Director of the Bureau of Nutritional Sciences. The latter position included responsibility for regulatory and educational programs in nutrition in addition to research.

Dr. Murray was closely involved with the many regulatory changes that took place between the 50s and the 70s and was responsible for a number of aspects of Nutrition Canada, our one and only national nutrition survey. Specifically, the biochemical laboratory and the preparation of the interpretative reports fell within his jurisdiction. Experience in international food regulations was obtained during 10 years as the Canadian delegate to the Codex Committee on Foods for Special Dietary Uses.

In 1979 Dr. Murray began a second career as a consultant which has provided a much broader range of experience as clients have included governments, national and international agencies, and a variety of food companies.

Dr. Murray is a member of the American Institute of Nutrition and a founding member of the Canadian Society for Nutritional Sciences. He was president of the latter organization for two terms, 1976-77 and 1977-78.

We are pleased to be able to publish the 1983 Earle W. Crampton Nutrition Lecture which was given by Dr. Murray on September 30, 1983.

to provide advice to this end and do so with Canada's Food Guide and Nutritional Guidelines. Less reliable advice is also readily available.

Does research play an important role in establishing this advice? Of course it does. It is through research that nutrient requirements are established, diet/disease relationships identified, and dietary advice developed. Having reached the stage where most of our nutrition problems are related to our choice of food we find that they are too complex to be dealt with by per-

sonal observation and are not amenable to trial and error solutions. Research in nutrition is thus an essential feature of our life and there is quite a lot of it going on. Is it being transmitted effectively to the public? Certainly there are some pretty strongly held views that it is not. It has been said, for example, that only a small percentage of research results have been transmitted to the public and there is a huge backlog of research waiting to be incorporated into dietary recommendations. While I don't agree with

this estimate I do agree that the results of research in nutrition are not effectively transmitted to the public.

There are many reasons for this. Many nutrition scientists are not very interested in communicating with the public and certainly do not see such communication as a duty. This is a rather interesting attitude since most scientists believe passionately in communicating with their peers or at least see such communication as an essential part of their career. I sympathize with the scientists' attitude — the effort required to convince review committees that a specific piece of research should be supported is greater than that imposed on most other elements of society. Many people can claim their reward by simply pointing at their past performance; research scientists must do that and also provide in persuasive detail what they will do next year if only funds are available. Small wonder that many scientists have little taste for communicating with the public even though the public is ultimately the source of the money used to support research.

Another inhibiting factor is the need to deal with the news media, an unattractive necessity for all but those who thrive on seeing their name in print or who think that television makes them appear younger than they are but wise beyond their years. The truth is that science is often transmitted badly by journalists and probably often transmitted badly to journalists by scientists. Whoever is at fault, many scientists are leery about describing their work to the press, television, or radio. Those who have learned to utilize the media effectively are probably devalued as scientists in the eyes of their peers. The interactions involved are fascinating.

A Complex Subject

A complicating factor is the fact that nutrition, in spite of being practiced and, to some extent, understood by everyone, is an extremely complex subject. Nutrition questions may involve biochemistry, molecular biology, physics, epidemiology, sociology, education, plant and animal science, genetics, and many more. Even well-trained nutritionists cannot begin to deal with all the facets of this wonderful subject; the less well-trained general public often has trouble with

the unfamiliar words and simply throws in the towel.

It is probably just as well that individual scientists are not regularly reporting their results to the public. Most research does not in itself indicate new directions for the public to take in their choice of food. This comes usually as the result of an accumulation of evidence from many experiments. Moreover, scientists disagree, honestly and strenuously, and while it may be argued that the public has a right to hear these arguments and decide for themselves, this is rather like testing might against right by throwing Christians to the lions.

Informing the Public

In spite of the difficulties we cannot ignore the question of informing the public of the results of nutrition research. Any gaps left by the scientific community are quickly filled by nonscientists and pseudo-scientists who first distort and then exploit the results of research. You know these people: they write books, they appear on talk shows, they travel the lecture circuit. Their message is always definite and generally promises a longer, healthier life for those who follow instructions — whether the instructions are for spoonfuls of cod liver oil, plates full of high fibre food, or massive doses of vitamins. Weight loss diets must outrank all other forms of nutritional advice in terms of numbers, popularity, money-making potential, and ultimate uselessness. That so many clear-thinking, hard-headed, confident individuals will pay for, follow, and promote dietary advice from charlatans who know less about the subject than they do is one of the mysteries of life. The best-seller lists almost always include a book on weight loss.

Why does spurious nutritional advice find such a ready and undiminished market while the real thing seems to be largely ignored? The obvious reason is that the spurious material is presented with confidence as a sure cure for whatever it is that ails the customer. Overweight? Take off 10 pounds in a week with this easy to follow "eat all you want" diet. Suffer from stiff aching joints? Our specially formulated blend of snake oils will end your suffering. Did you

ever see a stiff snake? Of course not! Legitimate nutritionists can't and don't offer a quick fix for all the ills of humanity. Most try to be realistic about what nutrition can and cannot do, but clearly a significant proportion of the population want a quick and painless cure for what ails them or what they imagine ails them.

I suspect that no one knows what real damage is caused by nutritional misinformation. It is surely aggravating and frustrating to nutritionists but that cannot be classed as real damage. There is certainly a real cost in wasted dollars — how many I do not know but I presume a very large sum. It is impossible to estimate the damage done to health through inappropriate or even hazardous treatment, through the promotion of unsound diets, and through the creation of public confusion. Most of this will never be identified, but we must be alert to any direct threats to health and do whatever is necessary to eliminate them. Except for such direct health hazards I am afraid we will have to put up with nutrition misinformation and be content to counter it with authentic information and service.

Canada's Food Guide

For present purposes we will consider authentic advice to be the nutritional guidance offered Canadians through public health programs and in the schools — namely Canada's Food Guide and Nutrition Recommendations. These basic messages are subject to two important restrictions: they must be appropriate for everyone except those excluded for reasons of specific health problems or because they are less than two years of age, and, in addition, they must be simple. The present Food Guide and Nutritional Guidelines satisfy these restrictions. Everyone is advised to include food from the four food groups while reducing their intake of fat, sugar, salt, and alcohol and increasing their use of fruit, vegetables, and whole grain cereals. This is good advice, sound advice, and I have no trouble whatever in endorsing it. Furthermore, it is simple advice, so simple that few should have trouble understanding and following it if they know of it and really wanted to follow it. We don't know to what degree the advice given to Canadians influences what they eat. Indeed, we haven't good information on what

Canadians are now eating. Casual observation suggests that while some people are trying to cut down their intake of fat, sugar, and salt, this is far from being unanimous and many people continue to choose a diet that does not closely conform to present recommendations.

Nutrition Education

It is probable that nutrition educators do not believe that they are combatting misinformation as effectively as they would like to. Certainly it is not difficult to encounter the opinion that nutrition education is a poorly-funded, neglected branch of nutrition. A striking contrast can be made between the advertising budget of any of the large manufacturers of food or drink and the entire federal and provincial budgets for nutrition education. If our entire budget for nutrition education doesn't equal that spent on the promotion of a single food, how can our message for moderation and a balanced diet prevail? It cannot! Nutrition education has two strikes on it in its struggle against misinformation. For reasons of scientific ethics it cannot claim freedom from disease nor guarantee a clear complexion, flexible joints, and a satisfying sex life for all who follow its advice. For reasons of government policy it has to make do with quite inadequate budgets.

Is there a solution? Let us fantasize that nutrition education budgets were magically increased several hundred times and the nutrition guidelines were hammered home with the techniques and persistence now reserved for soft drinks, beer, and cereals. That would get the old message across wouldn't it? In no time just about everyone would be following Canada's Food Guide and Nutritional Guidelines. Wouldn't that be marvellous?? It would be bloody awful! Do you really want to be reminded every day to select foods from the four food groups? Would you look forward to the whole grain challenge? (More than 50 per cent of white bread users said they preferred whole wheat.) Would you enjoy Ms. Penelope gushing that cutting down on sugar is such fun? (That's an Ontario example!) Could you stand watching that guy pull off his dark glasses and sing "Me and the boys and our fibre, we'll get enough never fear?" Quite apart from the unimportant fact that I

would hate it, there is some doubt in my mind that a hard-sell would be effective. Although we are in awe over the power of modern advertising, the effects of even a successful promotion are usually measured in sales increases of a few percent. We must keep in mind the nature of nutrition recommendations. By definition recommendations may be followed or not at the discretion of the individual; attempts at brain-washing are not warranted. By design the recommendations apply to the whole population and so apply to individuals to varying degrees. Not everyone will benefit equally from reducing consumption of fat, sugar and salt; some will not benefit at all. We simply do not know how much the incidence of chronic diseases would drop if every Canadian followed our recommendations. While we are doing the best we can with the information available, it doesn't make for a powerful message does it? And it wouldn't improve matters to promote present recommendations as if they were a soft drink. While I agree that budgets for nutrition education are disgracefully low, the more serious problem is with the information that is available for educational programs.

Research Needed

This brings us back to research. The most obvious way to improve the impact of nutritional recommendations is to make them more applicable to individuals. Not everyone who eats a lot of salt will develop hypertension. We must learn how to identify those who will so that our advice to reduce salt intake can be more definite, more precise, and carry with it a reasonable estimate of the consequences of not complying. Similarly, we must find practical methods to identify those who must make other specific adjustments to their diet because of some inherited characteristics. When we have reached that stage we can stop fussing about everyone following the same recommendations. In the meantime we must continue to disseminate the advice available to us. Although it has its limitations it is still valuable advice.

If we are to move towards this nutritional utopia, it is essential that the medical profession recognize the importance of nutrition in achieving good health and in maintaining it. For too

long we nutritionists promoted good nutrition on quite weak grounds and were puzzled and hurt when the medical profession was unimpressed. We should not have been puzzled; the consequences of poor nutrition that we talked about were simply not a big problem in most medical practices. Naturally, doctors were unable to get very agitated about nutritional information or misinformation. This lack of interest was self-feeding because medical schools paid little attention to nutrition, either in the training of doctors or in research of various kinds.

In recent years, as better evidence has become available on the link between nutrition and health, there are clear signs that the medical profession is changing its attitude. One very encouraging outcome is the increased emphasis given nutrition in our universities, particularly those with a medical school. The establishment of a Nutrition Centre at McGill University is a fine example of this increased emphasis and a fine way to focus the nutritional strengths that until now have been diffuse. The University of Toronto has similarly harnessed the nutrition resources of the Department of Nutritional Sciences, the Faculty of Medicine and associated hospitals, while the McMaster University Medical Centre and the University of Guelph are developing a very useful collaboration in nutrition.

One consequence of these activities is that more nutrition research will be conducted on problems recognized by the medical profession and the research will be improved because the participation of a variety of specialists is facilitated. As more doctors graduate with an appreciation of nutrition and as more of the specific nutritional requirements of their patients are identified the more involved in nutrition will they become. For their part, patients may recognize that nutrition problems are not dealt with by reading a procession of paperbacks, but by the health-care system.

Another issue that was raised earlier was the problem of transmitting the results of research to the public. Clearly not all research will alter nutrition recommendations and there should be a way of examining and evaluating research, putting it in non-technical language, and explaining its significance in practical terms. This is

(Continued on Page 37)

Library Gift

The Macdonald College Library together with the McGill Libraries now have the best Canadian collection on mycology (mushrooms and other fungi) outside the National capital. To augment its existing collection it received last November 9th another 211 books in 10 languages from Sydney Pierce of Ottawa.

A McGill graduate (Arts 1922, Law 1925), Sydney Pierce has been Canadian Ambassador to Mexico, Brazil, Belgium and Luxemburg, and the European Communities. At the University he produced the first Red and White Review and was founding president of The Players Club. He was a Redman footballer and, as a hurdler, was a member of the Canadian Olympic Team in Paris, 1924. He received an honorary LL.D. degree from McGill in 1956.

Sydney Pierce, now 82 years old, met his wife Jean Mather Crombie (also a McGill graduate) when they were both working as reporters at the *Gazette* in 1926.

A Donor's Thanks

When Sydney Pierce formally presented his library collection on mycology to the Library he responded to his hosts with exceptional grace and said:

"Ladies and gentlemen, you, Dr. Stepler (Chairman, Department of Plant Science), have made it appear as if on this occasion I was the benefactor, but I don't see it that way. I see you and your colleagues as ladies bountiful who are taking under your wing a couple of hundred mushroom books that were threatened with eviction and had nowhere to lay their weary spores. You, Dr. Stepler, and your colleagues Dr. Estey and Dr. Reeleder — you are professors — your homes are stuffed full of books. You read them all and you understand them. It is difficult for you in your position and with your background to understand what I went through.

"I bought my first mushroom book 40 years ago and brought it into the house. My wife accepted it without comment. When I brought my third mushroom book into the house, my wife said, 'Do you really need three mushroom books?'. After that I sneaked them into the house in brown paper bags. If my wife saw me, she'd say to

me 'That's not another mushroom book, is it?', and I'd say, 'No, It's just a copy of *Playboy*.'

"The day came when her favourite poetry books began to turn up in the broom cupboard and then she had to face the fact that I was a mushroom book addict. The day then came when I had to face the fact that I was 80 years of age. I realized that when I passed on I had nowhere to pass the books on to and, so, I turned to my family. My wife agreed to take one which was to be 'that big Larousse book about how to cook mushrooms.' My four children each agreed to take one provided they were more general and more-or-less along the lines of 'Mushrooms and toadstools — how to tell them apart.' Well that left me with

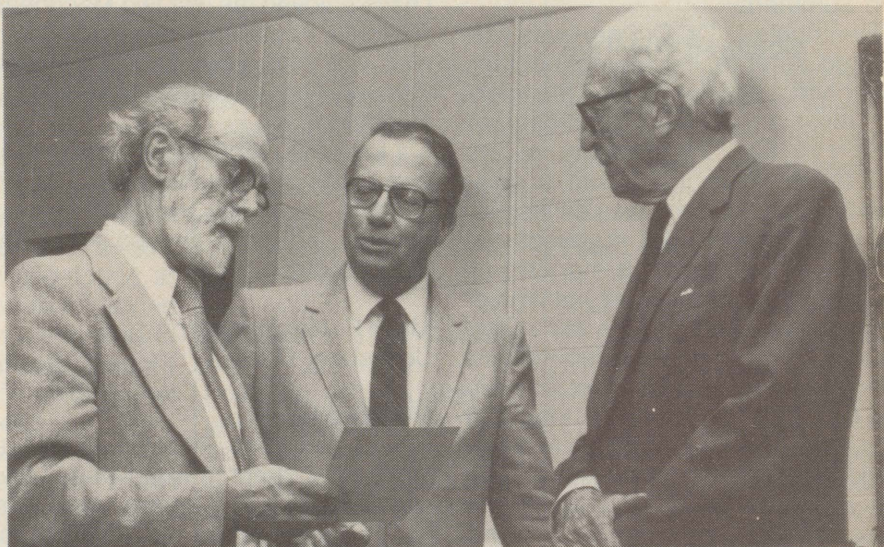
211 mushroom books in 10 languages. Ten languages was not bad for someone like me who was 1¾ bilingual.

"In despair I thought of my alma mater and, as you might expect, she came through and has provided a home for them. That's what brings me here today — to thank you very warmly. My wife would like it to be known that she is also here today and she thanks you very warmly indeed. All of our family would like to express our deep appreciation to you Dr. Stepler for all you have done, to Dr. Estey for his invaluable contribution without which this couldn't be possible, and to Dr. Reeleder for his help.

"May I thank you all for having arranged such a happy occasion as this to mark a happy outcome."



Discussing one of the books on mycology are, left to right, Dr. Howard Stepler, Chairman of Plant Science, Mrs. Jean Pierce, Marianne Scott, Director of Libraries, McGill, and Dr. Sydney Pierce.



Emeritus Professor Ralph Estey, a noted mycologist, left, pointing out an item of interest to Drs. Lloyd and Pierce.



Well Balanced Issues

Thanks for including all the graduates in the distribution of the August 1983 Journal. It was a well-balanced issue — recent College and Alumni news, reminiscences, subject matter, and a touch of humour.

It surprised me that, 57 years after graduation, some of the names mentioned were still meaningful to me — Dr. DuPorte, Dr. Crampton, Dean Barton, Emile Lods, L. C. Raymond, and Bob Summerby.

The tribute to Dr. DuPorte was well merited. After taking several courses under him, I believe his was the keenest, most analytical, best organized mind I've had the pleasure of encountering. With it, he had a quiet dignity, ready wit, and was an inspiration to his students. But, in your official records, I don't think his story would be complete without some mention of Professor Lochhead — his patron and mentor. "Pop," as we affectionately referred to him, was the most loveable and human of all my instructors, and the one best able to express in a few Anglo-Saxon words, concepts that took many Ph.D's a whole sentence in the Graeco-Latin so popular in the biological sciences. And a little footnote on Earle Crampton. If I'm not mistaken, it was he and possibly brother-in-law, Joe Bromont, who introduced the "pep rally" (à la Connecticut Agriculture College), on the eve of each football game. It took a while to catch on.

Stephen M. Walford, BSA '26
Wallingford, Ct.

Familiar Names

I have just read and thoroughly enjoyed the August issue of the Macdonald Journal. I was surprised that in one issue there would be mention of so many people I knew while at Mac. Although I have lost touch with almost all my old classmates, I have certainly not forgotten them or the professors who were so kind to all of us, and it was a real pleasure to read about

some of them. Clara Pi (nee Lee) (F.Sc. '75), one of my present colleagues, passed me the Journal. Clara and I have been working together at Burnaby Hospital for several years now and have developed a very exciting computer program for Food Service Management.

We have also talked about going to the Reunion '85 to help celebrate our respective '0th anniversaries; its hard to believe that 40 years could go by so quickly! Perhaps when it gets a bit closer to the time, we could do something about rounding up a few of our classmates to join us.

Margaret Galloway, B.Sc. (H.Ec.) '45
Burnaby, B.C.

Enjoying the Journal

I have enjoyed the last two Macdonald Journals. You are certainly doing very well with your news. So many people I knew who were featured in your magazine.

I knew Mr. McDougall from when I was a young girl (many years ago). We used to board in Ormstown for our summer holidays and so knew the families close to us.

Mary E. Heatherington
Cookshire, Que.

Memory Lane

Having served as Secretary to the late Dr. E. W. Crampton when Dean Lloyd was a student and later as Secretary to Dr. Lloyd when he chaired the Department of Animal Science, the August issue brought back memories. Articles on Professor Farmer and by Professor Donefer and Professor Buckland also waltzed me down memory lane.

The new format is great. Best wishes for the future.

Daisie Catto
Victoria, B.C.

To: Professor A.R.C. Jones Woodland Resources

I enjoyed reading your article on the "Maple Cinderella Syndrome" in the November issue very much. I wish I had the answer to your questions at the end of the article. There seems to be little evidence that MER will do any more for the high-value hardwood than it has in the past.

Both Dr. Luc Jobin (entomologist) and Dr. Gaston Laflamme (pathologist) read the article and both said that it was an excellent and up-to-date synthesis of our current situation. Congrats!

Bob Hatcher
Laurentian Forestry Research Centre
Environment Canada

Teaching Aid

I have been introducing the Macdonald Journal to our students. Many articles are very helpful as teaching materials.

Liang-chen Lu, B.Sc. (Agr.) '65
Associate Professor
Department of Animal Science
Taiwan Provincial Pingtung Institute
of Agriculture
Taiwan, Republic of China.

Bridging the Gap

Enclosed is my subscription renewal for two years.

There is a great need for agricultural information at a more advanced level than the "ordinary" farm magazines but on a level more practical and much more readable than the scientific journals. With the new Journal you seem to be bridging this large gap. Keep up the good work.

Bob McClelland, B.Sc. (Agr.) '77
Cantley, Que.

Many Happy Years

I enclose a cheque for a subscription to the Macdonald Journal. Although not an alumnus of Macdonald, I have fond memories of the many happy years when I lived on the old Campus.

It was a delight to read the articles in the August issue referring to Dr. DuPorte, Florence Farmer (always called "Fluffy" in my day), and of course the good old Agronomy Department.

I hope that succeeding issues will be of equal interest.

John Summerby,
London, Ontario.

News of Former Students

I really like the new Macdonald Journal, and I like the news of old students.

Norma Holmes,
Stanstead, Que.

FUN FACT FABLE FICTION

by Ralph H. Estey
Emeritus Professor
Department of
Plant Science

Two Bits

During a period when silver was scarce, Spanish coins known as "Pieces of Eight" were accepted as the equivalent of silver dollars throughout the United States and the adjacent areas of Canada. These coins could be divided into eight pieces or "bits," each having a value of 12½ cents. Hence the term "two bits," as occasionally heard today, meaning 25 cents.

Fact or Fable?

Modern scientific evidence to substantiate the biblical story of the flood has come from deep sea-bed cores collected in the Gulf of Mexico. Nearly 10 years ago researchers from the University of Miami, Florida, found that the global sea level rose substantially some 11,600 years ago (*Science* 189: 1083). That happens to be the date that the Greek philosopher Plato estimated to have been the time of the flood. It also coincides with a time when great glaciers and icecaps were melting.

Love Story

Have you heard the sad story of the two white corpuscles who loved — in vein?

Slaves in Quebec

The *Montreal Gazette* on March 18, 1784, had an advertisement in which a Madame Perrault offered a woman for sale. Slavery was legally permissible in Lower Canada (Quebec) until the Imperial Act of 1833 disallowed it in all colonies.

A New Break for Labourers

In November 1975, the *New Scientist* magazine carried a story about the 1,600 members of a union of goldminers in Fiji who demanded that their lunchtime be extended to include "a 30 minute midday sex break." Their union secretary claimed the demand was made because midday is the best time for sex. He argued that a man has a sexual obligation to his wife and if he goes home exhausted after a day of work in the mine he cannot fulfill it. A few years later the *Woman's Own* magazine in Britain concluded a delicate survey and found at least half of the married readers who responded to a questionnaire thought their sex life was below average because their husbands were poor lovers. Could it be that British labourers, like their Fijian counterparts, are just too tired after a day at the shop? On the assumption that this may be so, enterprising union leaders should insist that a passion break be written into all labour-management contracts, in addition to the usual coffee break. Perhaps the government in an attempt to regain the lost support of many women and unions should make such a clause mandatory in all labourers' contracts. A law like that would quickly be enacted because no political party would want to be accused of disregarding women's rights to a fair share of the amorous output of the nation.

Fact

If a man and a horse are weighed separately and their weights added, the sum is slightly more than if the man gets on the horse and the two are weighed together. The man on the horse is higher above the earth's surface than when he stood on the scales; therefore, he will weigh slightly less, even though that slight difference will not be recorded on the scales normally used in commerce.

Fable

As a child I was told that if I stood at the bottom of a deep well or a mine shaft and looked upward I could see the stars even at midday. That is an old superstition with no basis in fact.

Fertilizers of a Century Ago

Poudrette is the contents of privies dried and rendered as inodorous and inoffensive, by chemical process, as the common earth . . . It is the most efficient, in the immediate effects, of any manure we have tried . . . It has been long used about Paris . . . Manufactories of poudrette have been established in the vicinity of New York.

Urette is animal urine, absorbed and rendered dry by mixture with calcareous earth. It possesses the like fertilizing virtue of poudrette . . .

Jessie Buele, 1842,
The Farmer's Companion, p. 72

ROOTS

Everyone has ancestors. It is only a matter of going back far enough to find a good one.

A New Kind of Shoat?

Biologists at the Babraham Institute of Animal Physiology in Britain have created a new kind of animal — a cross between a sheep and a goat. No, they cannot call it a "shoat" because, as every farmer knows, a shoat is a young weaned pig.

There is one thing more exasperating than a wife who can cook and won't and that's the wife who can't cook and will.

R.L. Frost

A Timely Reminder

A notice in a recently opened medical clinic: "The waiting period for abortions is now 10 months."

Front Seat Centre

In July 1886 Sir John A. Macdonald, Prime Minister of Canada, made his first trip across the Rocky Mountains. While he was enjoying the mountain scenery from a comfortable seat in the observation car at the rear of the train his wife was riding outside on the cowcatcher in front of that special train. Lady Macdonald insisted on getting on the cowcatcher when the train stopped at Laggan Station not far from Banff. She stayed there, seated on a small box, until the train had taken her through the mountain tunnels, past Palliser and well into the Fraser Valley. Lady Macdonald saw the Canadian Rockies from a seat on which few others would dare to ride. If that kind of behaviour is typical of the energy and will power of Macdonald's wife, it is no wonder he became one of the best known of Canada's Prime Ministers.

"What a wonderful time it has been!"

**by Dr. William Rowles
Emeritus Professor of
Agricultural Physics**

In thinking over my time at Macdonald College I'm glad I saw some of the early days. It comes as a surprise, and rather a shock, to realize that so long a time has passed since then and what a wonderful time it has been.

The fact that I joined the Agriculture Faculty is not surprising. As a 10-year-old boy, I was brought from England to Manitoba by my parents in 1910, and five years later, when homesteads became available further west, my father successfully got one and our family of seven moved to a prairie farm. Soon after I was sent to the University of Saskatchewan to take the Associate Course in Agriculture (equivalent to Macdonald's Diploma Course). Later I moved toward the Degree course and then to B.Sc. (Physics). After further study and some teaching, I graduated B.Sc. (Honours Physics) in 1924 and, with the help of a Canada Research

Council bursary, I was able to come to McGill in 1925. As things turned out I've been at McGill (and Macdonald) ever since.

While still doing my McGill research in 1927 Dr. Barton, who was then Dean of Agriculture here, arranged for me to commute from Montreal twice a week to teach in the Physics Department. After getting my Ph.D. at McGill I was appointed Lecturer and moved to Macdonald to live in the "Bachelors" Club, in a wing of Brittain Hall, across the hall from Professor Coulson of Plant Pathology. At that time a number of lady members of staff lived on the upper floor of Glenaladale, and meals were available in Stewart Hall for them and for the "bachelors."

After Dean Barton resigned in 1933, Dr. W.H. Brittain became Dean of Agriculture. By then, a good number of years had gone by and with teachers, support staff and families on campus and in the village, there was a strong community spirit. Indeed, in 1926 the local Philharmonic

Society staged a performance of "The Mikado" in the College Assembly Hall.

In those days the College was very self-sufficient. There were few, if any, automobiles. CPR and CNR did run daily trains to Montreal, but until 1923 there was no direct road connection to Ile Perrot except across the ice. The buildings were steam-heated from coal-fired boilers, and lighted by 220 volt direct current dynamos. But there was no covered skating rink, no Centennial Centre, no Laird Hall, no Infirmary, no Soil Science or Parasitology Building, no safe overpass across the railways to reach the barns, Seed Farm, or Arboretum. There were, however, the excellent teaching buildings, student and staff residences, all connected to the Power House by underground tunnels.

Because of the original layout there was more room on campus in those days. For some years and until the rows of huts were built for married McGill veterans of World War II, men



Professor William Rowles in his lab in the Chemistry Building identifying elements with a Littrow spectrograph, 1953.



Agricultural students working in the general physics lab, 1953-54.



Drs. William and Laura Rowles reminiscing with graduates Robert Orr and Ernest Grant at the '83 Reunion.

and women of the staff enjoyed a nine-hole golf course covering most of the open areas. The non-academic men had a bowling green.

For several years pupils of Grades X and XI came from the nearby high school and were taught Physics, Chemistry, and Manual Training by Agriculture staff members.

While many students were from Quebec and Ontario, a good number of Agriculture candidates came from the Maritimes for their third and fourth years. Others came from Britain under a CPR-assisted plan for Diploma or Degree work. Many of these, following outstanding leadership in student activities, now hold positions of importance world-wide. At Macdonald, far more upper-level studies were in Agriculture or Home Economics than with the School for Teachers. Consequently, most senior positions in student organizations fell to them.

The students themselves ran competitive debates, class plays, open house days, and Green and Gold theatricals. There were swimming meets, soccer, rugby, football, hockey, a rifle club, sports days, and

delightful formal dances. In later years, when Mrs. Rowles and I lived in a campus house and had no children of our own, we became closely involved with the students in many of these activities.

Staff members had play-reading gatherings in Glenaladale and put on many three-act plays in the Assembly Hall.

Time passed and, soon after Dr. Brittain gave his semi-centennial address in 1955, Dr. George Dion took over as Dean. The enormous College expansion including the Soil Science building, Centennial Centre, Infirmary, extra staff housing, the seed production building, and so on that occurred over some 20 years, bears testament to the energy and skill that Dr. George Dion brought to his Deanship from 1955 to 1971.

Then, largely due to the policy of the Quebec Ministry of Education and big increases in Faculty of Education members, the whole Education Faculty was moved to Montreal, leaving empty residences and classrooms. Long discussion between McGill administration, Macdonald Faculty, and the Provincial Ministry finally led to

the big upheaval. The whole Main Building-Chemistry-Soil-Science-Biology complex was turned over to John Abbott CEGEP, which was further enlarged to cover most of the open space where the old willow tree used to stand. At the same time a new general Agriculture and Food Science teaching and research centre, known as the Macdonald-Stewart Building was built and occupied.

This new building must be seen and visited to realize the thought which went into its planning. Dr. A. Clark Blackwood was Dean during the move into the new quarters. I shall not attempt to describe the result, but there is no doubt the planners have done a masterful job.

Through some accident, soon after the former Main Building was altered its central tower-flagpole collapsed. However, Macdonald achievers rejoice to see that the tower has been renewed and CEGEP authorities have agreed to fly the Macdonald flag on special occasions.

During my time at Macdonald considerable changes have taken place. In our Physics-Chemistry group times varied from depression days when

much of the apparatus had to be hand built, to times when generous grants were available to buy special equipment. Good demonstrators for Physics labs often came from Chemistry. We often had staff members of quite special talent. My earliest assistant, Dr. Darol Froman, was one. He travelled several times to Pike's Peak in Colorado to measure cosmic rays and had a counter going in his garage for the same purpose. He later shared in the work when the first atomic pile became active in Chicago, and later became Associate Director of Research at Los Alamos. Dr. Warkentin was our Soil Physics man before there was a Soils Science Department. And for a long time Dr. Fraser Oliver was a pioneer in the radioactive tracer work. Dr. Douglas followed me as Chairman of the Physics Department and he, with others, has organized courses in applications of Meteorology to Agriculture.

What has made *my* last 50-plus years so happy is the fact that *two* of us have shared them together. Laura Chalk graduated (Ph.D. Physics, McGill) on the same day I did, and in 1930 she was appointed Lecturer and



Home Economics students busy measuring calorie content of food in the physics lab, 1953-54.

taught in the Department for a number of years. We were married in 1931 and lived in a College house for about 30 years. She taught Calculus, Differential Equations, Statistics, helped with the McGill RCAF Radar Technicians Course (in which we all

took part), and helped out again when the veterans returned after the war.

We are now happily settled in Baie d'Urfé, about 15 minutes walk east of the College buildings, and are always glad to welcome friends of days gone by.

Macdonald and Beyond

by Vivian Shipley, B.Sc. (H. Ec.) '48

For many years Macdonald has had a major influence on my life. Our relationship, which was an interesting and fruitful one, saw me through elementary school, high school, and university from which I emerged with a Bachelor of Science degree in Home Economics. Although Macdonald presented me with many challenges and exacting academic demands, it also provided innumerable opportunities for all round development. Bouncing around between basketball teams, ski clubs, rifle shoots, skits, debates, fashion shows, and varied social activities, and from the "joe-girl" to the executive capacity, provided me with many personal satisfactions, enjoyable experiences and meaningful lifetime friendships — a unique, rich atmosphere for developing from childhood to adulthood.

Upon graduation, I followed my yearnings to broaden my horizons. The following decade saw home move from Three Rivers to Paris,

France, Ottawa, Hamilton and the Eastern Townships. During this period, my husband, Bill, also a Macdonald undergraduate and postgraduate, and I liaised with the Campus mainly through Alumni and Semi-Centenary executives.

When Macdonald beckoned for Bill to return in an administrative capacity, it drew us back like a powerful magnet. This proved a wise decision for us all, including our growing family who benefited from the fertile environment. The campus ambience soon prompted me to further academic pursuits in a discipline greatly expanded since my undergraduate days. I explored the social sciences on the McGill Campus to the Master's Degree level.

When a teaching appointment in the School of Food Science was offered, I was delighted. This new Macdonald perspective, of course, had its demands but proved very fulfilling and expansive. The relationships with students corresponded with our children reaching adulthood, adding fur-

ther understanding to the visions and traumas of the young people of the era.

During this period, we also launched into one of Bill's lifetime goals — the acquisition and operation of a farm property. We located in Gengarry County in eastern Ontario — a pleasant farming community an hour's drive from the campus. Then began a decade of varied experiences ranging from beef farming and land improvement to renovating a century-old stone house.

After several years on the staff, I again felt the urge to emerge from the protective Macdonald environment. This led to free lance assignments and consulting work in Montreal and Ottawa. However, with retirement looming it seemed time to change gears. Having long enjoyed and appreciated the "arts" with little background knowledge, I spent three years studying various fields of fine arts. Realizing how well these pursuits would blend with our choice of country living, I selected to develop

serigraphy or screen printing. This meant transforming our unused milkhouse into a studio by winterizing the location as well as incorporating required equipment, work, and display space.

This form of expression consists of printing with oil paints through stencilled silk screens onto paper, cloth, or almost any flat surface. Any number of colours can be used, each colour requires its separate screen. All degrees of complexity can be achieved, thus providing a perpetual challenge. It can be adapted from crafts items to elaborate fine arts prints. Not only does time fly in the "milkhouse studio" but it is very satisfying. The results include prints, cards, placemats, wall hangings, book marks, tote bags, cushions, coasters, and so on.

In spite of sales from the farm and in gifts shops, the studio was soon filled to capacity. Arts and Crafts Associations proved an excellent marketing tool as well as an interesting and stimulating group of artists and craftsmen. This led to an invitation to join a group of 20 crafts people who operate a cooperative shop of handcrafted items near Upper Canada Village during the summer months.

To dispel the impression that Glengarry is limited to craft activities, I have also taken up golf, belong to the University Women's Club, an art club, a book club, and have even been involved in the occasional bridge game. Contrary to all warnings of country isolation, eastern Ontarians are very friendly and highly motivated in many varied interesting pursuits so that one has the difficult problem of selection.

Several others from the Macdonald clan have discovered and selected Stormont and Glengarry as their home. From the staff, Diane Raymond, Micheline Chevrier, Norm and Betty Campbell, and Stuart and Martha Bowman live in the area, and we are frequently meeting former Macdonald students.

Undoubtedly, as Bill is taking early retirement, he will find our farm and country location as stimulating and fascinating as I do. We will enjoy developing it further in the future. We both realize that Macdonald was for us the catalyst which inspired and directed our life choices and for this Bill and I will always be extremely grateful.



Vivan Shipley screen printing in her "milkhouse studio."



Tote bags, prints, cards — including the Raymond Building, above, and the Memorial Clock — are made and sold. The cards are on sale in the College Bookstore.

Robber's Roost — Open to Macdonald Graduates

In the Centennial Centre, the hub of Macdonald College, Robber's Roost offers a wide variety of Macdonald souvenirs from the decorative to the functional, including ties, beer and coffee mugs, and a variety of shirts in various colours and all sizes — T-shirts, sweatshirts, rugby shirts and baseball jerseys. For further information and prices, write to Robber's Roost, Centennial Centre, Macdonald College, Quebec, H9X 1C0. Mail orders are accepted.

A great idea for a gift!

ROBBER'S ROOST

CENTENNIAL CENTRE

For a wide selection of Macdonald souvenirs

Open: Monday - Friday
8:30 a.m. - 4:30 p.m.

Tel.: 514-457-5784

SUCCESSFUL REUNION

The Grad Reunion was really a great success. The members of our class of '33 would like to say a very hearty "thank you" to all those who were responsible for the planning which made this event something we will always remember. Over a period of 50 years friends often drift apart; as a result, we were only able to locate six of the original class. Three of these were from Ontario and three from Quebec. One from Quebec was unable to attend. Some of us had not met since '33, so we had a grand time reminiscing. We have all operated our own farms, and I'm sure the training and help we received at Mac has been more helpful to us than we often realize.

We have had College Test Plots on our farm at Lachute, and Professors Raymond, Crampton, Hamilton, Ness, and Stepler (to name a few) were frequent visitors, and gave us helpful advice and many new ideas.

Naturally the campus at Mac is not the old "HOME" we used to know, and, as we don't get back as often now, we feel a bit lost. The Farm Tour which was organized on Reunion day gave us an opportunity to realize the progress which has taken place over the years.

We enjoy the new Journal very much; it helps us "Old Timers" to keep up with modern ideas and activities.

Robert McElroy, Dip '33
Lachute, Quebec

REUNION REACTION

I was not too successful in getting our year ('43) enthused about a reunion. Two or three letters to each classmate and several telephone calls resulted in six attendees out of a class of approximately 25 to 30. One member came from Nova Scotia, one from New Brunswick, one from Florida, one from Ontario, one from New York and the sixth from Montreal.

It was about 35 years since I had visited Mac and the same time had elapsed for most of the others. The campus, as we recollected it, had changed drastically and I was a little saddened to see the former men's residence boarded up for this was the scene of my most happy memories. I



Gathering around the sundial in front of the Centennial Centre are some graduates who have given full time and effort on behalf of the Macdonald Branch and College activities: left to right, Larry Johnston, Chairman of the Macdonald Alma Mater Fund Committee, Grant Ross, Vice-President, Macdonald Branch, Steve Olive, Chairman, Reunion '83, and Peter Knox, President of the Macdonald Branch.

think all of my classmates were very favourably impressed with the new campus and several expressed their enthusiasm for the new and better laboratory facilities. I was pleased to see that efforts are being made to maintain the "oval," once almost hallowed ground.

Our group of six indulged in all the official activities which we enjoyed thoroughly. We were particularly pleased to chat with Dr. and Mrs. Rowles. Dr. Rowles had taught us calculus and physics and was always remembered with affection even though his courses were not easy.

I attended the lecture on Macdonald-International and was pleased that Mac spreads the gospel worldwide. I was surprised to discover that the language of the corridor is now French. I chatted with several francophone students and was pleased to discover that they had come to Mac for a good education as well as to improve their English.

It was 35 to 40 years since most of my classmates had seen each other and our recollections of our days at Mac were generally that it was a warm, happy and delightful experience, probably the most carefree and pleasant of our lives.

Ernest Grant, who was present at the reunion, mentioned several of our classmates who had achieved some scientific distinction. I ultimately graduated in medicine from McGill and found my training at Mac an excellent background for the study of medicine. It was interesting to discover that the

Nutrition Staff are now associated with the Department of Medicine at McGill.

Next year I shall retire from medicine, work part time on our small farm and expect to enroll in the Master's program in English at the State University at Albany.

Each of my classmates had been involved in work activities directly related to the training they had received at Mac but reached the stage where they were tapering off.

Good luck with the Macdonald Journal

Robert Orr, B.Sc. (Agr.) '43
Scotia, New York

MACDONALD BRANCH REPORT

The executive of the Macdonald Branch met in November for the first time following Reunion '83. High on the agenda was a discussion on the success of this year's Fall Homecoming, which Chairman Steve Olive confirmed in his written report. The number of returning graduates exceeded most expectations and kept the reception area of the Centennial Centre bustling with activity. An added bonus was that the majority of events were financially self-sufficient.

Various recommendations were reviewed, some of which were incorporated into the plans, already underway, for the 1984 Reunion, which will take place on September 29, 1984. Crucial to the planning of events are the Class Chairmen, a vital communi-

cation link between Macdonald and its graduates in relaying information and encouraging everyone to make an early commitment to get together for the Fall Homecoming. A subscription to the quarterly Macdonald Journal was also recommended as an excellent means of keeping in touch with Macdonald between reunions.

On the termination of his office, Chairman Steve Olive said that he looked forward to future reunions when he would have the opportunity to see more of his colleagues and they of him. He offered his congratulations to the newly-elected Reunion '84 Chairman, Georges Eades, and Co-Chairman, Robert Gales.

Branch President Peter Knox reported that the new entrance to Macdonald College, off the Lakeshore Road, which would considerably enhance the campus, is scheduled to be completed for Reunion '84. This would be a memorable date to officially commemorate this milestone.

Faculty representative on the Board, Dr. Hans Hueckel who has initiated the gold key award program, which recognizes the outstanding contribution of some students in extra-curricular activities at Macdonald, would shortly be reporting on progress in this area.

President Peter Knox attended the annual Scholastic Awards Banquet at Macdonald, on November 3, 1983, where he presented three \$1000 entrance scholarships to students for their outstanding academic achievement. The award recipients were Mr. Mott, Mr. Burns, and Ms Fitzgerald. On his occasion, Ms Elizabeth Pace was also presented with a Macdonald College bursary.

The Officers and Directors of the Branch for 1983-84 are as follows:

Hon. President

Dr. David Stewart

Past President

Larry Johnston, B.Sc. (Agr.) '72

President

Peter Knox, B.Sc. (Agr.) '74

Vice-President

Grant Ross, B.Sc. (Agr.) '56

Treasurer

Gaye Mullins, B.Sc. (H.Ec.) '68

Secretary

Jean McHarg, B.Sc. (H.Ec.) '60

Faculty Rep

Dr. Hans Hueckel, B.Sc. (Agr.) '60

Directors

Gordon Anderson, B.Sc. (Agr.) '55, M.Sc. (Agr.) '57

Gloria Bishop, B.Sc. (H.Ec.) '57

Harold Blenkhorn, B.Sc. (Agr.) '50

Pierre David, B.Sc. (Agr.) '76

Georges Eades, B.Sc. (Agr.) '74

Robert L. Gales, B.Sc. (Agr.) '68

Robert Heslop, B.Sc. (Agr.) '53

Pat Jared, B.Sc. (H.Ec.) '57

Regional Vice-Presidents

M. Ahmed Ashraff, B.Sc. (Agr.) '49

Carl M. Bingeman, B.Sc.(Agr.) '49

Sybil Cutcliffe, Dip. Ed. '54

Chesley E. Smith, B.Sc.(Agr.) '54

Chairman, Nominating Committee

Larry Johnston, B.Sc. (Agr.) '72

What is the A.M.F.?

This was a question raised by Dr. Roger Buckland, Chairman of the Department of Animal Science at the Annual General Meeting of the Macdonald Branch. Dr. Buckland was surprised to see the treasurer of the Macdonald Branch reporting very limited resources, while the Alma Mater Fund had experienced a banner year.

The explanation is that the Macdonald Branch handles its own activities which it tries to keep on a self-sufficient basis and maintains its own bank account. The Alma Mater Fund (A.M.F.) for Macdonald College is a project of the Graduates' Society of McGill University and administered by the Development Office. Gifts and donations from graduates and friends of the College to the Annual Giving Program (the Macdonald Alma Mater Fund) are designated in a variety of ways to support the College. The majority of the donations are earmarked for Faculty development which is administered by the Dean of the College. Donations specifically designated for the library, campus care, scholarships, or any other area of College endeavours are distributed directly to the particular department involved.

AMF Committee Report

This past year, the Chairman of the Macdonald Alma Mater Fund, Larry Johnston, BSc. (Agr.) '74, was able to

report that Macdonald graduates donated more than \$52,000 to the University. Of this money, more than \$26,000 was specifically earmarked for the Faculty of Agriculture and was administered by Dr. Lew Lloyd. Dr. Lloyd explained that current budget constraints made these flexible funds extremely important for special projects of the Faculty and of the students which were outside of regular operating funds. The Alma Mater Fund Committee of Harold Blenkhorn, Jim Wilding, and Larry Johnston was particularly pleased with the improved participation of Macdonald alumni and friends in the past year. The participation exceeded 21 per cent which put the Agriculture Faculty and School of Food Science in the top per cent of participation of all other McGill University areas receiving annual alumni support.

Objective for 1983-84

This fall, just prior to Reunion, the committee established their objective for the current year. The goal for 1983-84 (fund year from June 1, 1983 to May 31, 1984) is \$56,000. It is hoped that all Macdonald graduates will consider a donation to the College and that the recent classes may wish to earmark a modest donation in support of Macdonald with the objective of contributing to the overall participation of our alumni. Dr. Lew Lloyd indicated that he welcomes the guidance and recommendations of the Macdonald Branch as the representatives of the alumni of the College but points out the important distinction that A.M.F. funds are administered by the Dean, and the Macdonald Branch funds are a separate item. The Branch is self-sufficient and receives support from the Graduates' Society of McGill University but does not require financial assistance from the Alma Mater Fund. In this way all donations from graduates can be directed to the development of the Faculty and the School of Food Science or any other area of the University for that matter.

The Macdonald AMF Committee extends its appreciation to current donors and class agents who have been so thoughtful in their efforts on behalf of the University in general and Macdonald in particular. What is the AMF? It is the promotion and development of Macdonald College.

DIPLOMA

C by Jim Currie
Assistant Director
Farm Practice

O Are successful people born or made? Who knows, and who really cares? Isn't it enough that we can pick out dozens of success stories and know that they all got to where they are in their own way? What I've noticed from writing these articles is that the people who most other people consider successful have a number of attributes in common. For one, they have almost all shown a quiet and self-confident manner. Few of them are boastful braggards always drawing attention to themselves. They all seem to recognize a job, get at it, get it done, and prepare for the next task in a planned, logical order. All of the successes have energy to burn, working as long as necessary and with a continuous well of enthusiasm which infects other people around them. In this column, they are all Diploma graduates.

One factor that doesn't seem to matter at all in these cases has been their place of origin. We can identify successes from all walks of life, all backgrounds — rich or poor — and all areas. This says a lot for our way of life in this country when anyone can become a success if he is brought up to believe that he can. Maybe that is why we will never solve the "born or made" question.

A case in point might be a Diploma graduate who recently visited Macdonald College as the guest speaker at an economics seminar. Mr. Elwood G. Hodgins, "Dip" '57 is one of those men who came to "Mac" from a small farm and instead of returning to that farm, he went on to be successful in a different part of the industry. His present position is Vice-Chairman of the Canadian Dairy Commission. It seems appropriate in this, the dairy issue of *The Macdonald Journal*, to recognize the career of one of the most influential men in the Canadian dairy industry.

Elwood Hodgins was born in Timmins, Ontario, but his parents soon realized the error in their ways, and moved to a farm near Shawville, Que-



Relaxing at Tadjia Hall after a seminar are, left to right, Dr. Garth Coffin, Chairman of Agricultural Economics, Jim Currie, author of *Diploma Corner*, and seminar speaker Elwood Hodgins, Dip. '57, Vice-Chairman of the Canadian Dairy Commission. Mr. Hodgins's seminar talk appears on page 34.

bec. As a young boy growing up in rural Quebec, it is not surprising that his interests were in things agricultural. Even in those early days in Shawville, he displayed the traits that have carried him to where he is in the industry. He got involved. He was enthusiastic. He became a leader. In fact, he appears to have been a leader throughout his life. His records show that as a young man he was the president of the Shawville 4-H Dairy Club and of the Bristol 4-H Grain Club. At one time he was a director of the Shawville Fair Board.

His interests seem diverse, and were; yet his main pre-occupation was with the dairy industry. Work on the home farm showed him the practical side of farming while his involvement in 4-H exposed him to showing, judging, and proper breeding. He became a very good cattle judge. In 1955 he was the Quebec Provincial Champion 4-H Dairy Cattle Judge. He went on to the Canadian Cattle Judging competitions held during National 4-H Week in Toronto. He won there, also.

That year, 1955, Elwood Hodgins entered the Diploma Program at Macdonald. Again, he was recognized as a leader by being elected class president. (He didn't discuss life at Macdonald to any great extent, but presumably, with classmate like Elmer Block and John Logan, it would have been a typically quiet, reserved

Diploma class.) He did say, however, that like most farm lads, he had intended returning to the farm afterwards. He wanted the added education and the exposure to modern information that the Diploma program offered and the contacts that could be made while at Macdonald. He got them but like so many others he realized that the home farm was not big enough for both him and his father to make a good living and at that time they couldn't get bigger. He made the decision to get a job — just for a few years — until he could afford a farm of his own.

His first job was as a fieldman for the Carnation Company working out of St. Mary's, Ontario. This job involved meeting a lot of farmers, doing promotional work for the company and learning the quality control standards of the industry.

In 1961 Elwood changed employers. He stepped up to field supervisor with the Ontario Whole Milk Producers League and moved to Toronto. Again, he was on the road to leadership. In the five years he was with this group he was introduced to personnel supervision, quota agreements, and milk pricing policies — experience that would serve him later in his career.

When the Ontario Milk Marketing Board was formed in 1966, he was chosen as the supervisor of Field Services. As such, he had to select 16

field persons and develop the Board's field service program. To a large extent his work became a liaison position, insuring that there was a good flow of information to the farmers about all of the programs and activities of the O.M.M.B. and of the Canadian Dairy Commission. He organized educational programs for the farmers on topics such as Group I and II Pool quota programs and conversion from can to bulk milk haulage. This was to help farmers in one of the first of many conversions that they have had to make in an era of rapid change. At this time, he also got his first exposure to the Canadian Dairy Commission through liaison work and co-operative ventures.

In 1974 he was appointed Executive Director of the Ontario Dairy Council. In this position he represented the interests of the dairy farmers and milk processors and presented their views on conditions in the dairy industry to the O.M.M.B.

In 1977 Elwood Hodgins was appointed to his present position of Vice-Chairman of the Canadian Dairy Commission. As such, he is one of the three members appointed by the Governor-in-Council, pursuant to the Canadian Dairy Commission Act. The members are responsible for the development of policies and programs which achieve the objectives and obligations of the Commission. This commission, at present chaired by Gilles Choquette, reports directly to the Minister of Agriculture, the Honourable Eugene Whelan.

It is the responsibility of this commission, therefore Mr. Hodgins, to look after the interests of the overall dairy industry and to be aware of the concern of the processors in respect to the policies of the commission. Since he has worked at all levels of the business, from farming on up, he has a realistic handle on his responsibilities to the industry he serves. His appointed duties are many, too many to list here but, in brief, they cover all aspects of an organization that administers approximately \$1.29 billion and maintains a staff of 75 people. His main interests are the administration of research programs, communications, and processing in the market. Comments on the Canadian Dairy Commission can be found elsewhere in this Journal.

On a more personal basis, during his climb up the ladder of success, Elwood

did not neglect his personal life. He is proud of his wife and three daughters, who he claims have given him the encouragement and support to reach this point in his career. Nor has he shirked his duty to the community. Elwood has been a leader in youth groups, community and farmer organizations, as well as serving on church councils. To fill in his spare time, he participates in active sports such as curling, softball, basketball, or he putters around the home doing handyman duties or gar-

dening.

So what is his secret? What is his outlook on life? His advice to young people would be never to let emotions override business management skills. Set goals and if something conflicts with those goals, don't do it. Get into a stable business area but use proper management techniques to improve that business. Look at alternatives and stay open-minded.

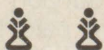
From the outside looking at his career, I might add — Get Involved.

Seeking Solutions

Specific apple replant disease (SARD) is a condition leading to poor growth and occasionally death of young apple trees planted on sites from which older apple or pear trees have only recently been removed. According to **Professor Deborah Buszard**, Department of Plant Science, this problem is widespread and attempts to control it usually rely on chemical soil treatments. Her research will assess the extent and severity of this problem in Quebec, and test possible treatments to enable replanting to take place.

New orchards of dwarf trees are replacing existing standard orchards and introduction of new cultivars to replace some of the McIntosh trees continues. Replanting programs have been made more urgent by the disastrous winter of 1980-81 which killed many apple trees in Quebec. It is likely, therefore, that many growers will be planting new trees on sites which have only recently been cleared from old standard trees. Specific apple replant disease will be a serious problem for these farmers.

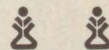
Professor Buszard will test for the causal agent of this disease and, eventually, a remedy should result.



The horn fly *Haematobia irritans* has long been recognized as an important pest of cattle. The minimum cost of biting flies, in terms of unrealized potential production of beef, is in the order of \$105 million for Canada per annum; it is estimated to be about \$14 million for Quebec. Recent findings by **Professors David Lewis** of the

Department of Entomology and **Elliot Block** of the Department of Animal Science have revealed a relatively high degree of infestation of the horn fly on both beef and dairy cattle in southern Quebec. The levels of infestation suggest that there may be significant losses in productivity. While horn flies can be controlled with insecticide-impregnated ear tags, Professor Lewis feels that biological control of horn flies may also be feasible.

Strains of certain bacteria are being developed as biological agents to control insects. The availability of commercial preparations of the bacterium *Bacillus thuringiensis* for experimental use has stimulated research relating to horn fly-microbial interactions. Reduction of horn fly populations may significantly increase the rate of weight gain in beef cattle and milk production in dairy cattle.



Each increase of 100 kilograms of milk per cow per year increases the net income over feed cost of Quebec herds by \$14 million. This could be the result of improved feed analyses and feed recommendations. **Professor J. Moxley** and his group are planning to use the extensive data base of the Dairy Herd Analysis Service (DHAS) to provide information on nutrition management. Their research will determine the pre and postpartum nutrition and management conditions that maximize milk yield in Quebec herds. Detailed feed analysis and input have been reported in DHAS herds since October, 1979, with varying levels of production response. The use and value of feed analyses will be estimated. More specific dry cow and postpartum nutrition and management could be recommended if the research goes as planned.

The Role and Functions of the Canadian Dairy Commission

by **Elwood Hodgins**
Vice-Chairman
Canadian Dairy Commission

Editor's note *This article is based on a seminar presentation made by Mr. Elwood Hodgins to degree and Diploma students as part of a series of seminars organized by the Department of Agricultural Economics on the theme of "Intervention and Efficiency." The seminar series is designed to examine the various ways in which government intervenes in agriculture and the effects of that intervention. The focus of this article is the Canadian Dairy Commission and the industrial milk sector.*

Mr. Hodgins, Vice-Chairman of the Canadian Dairy Commission, is a 1957 graduate of the Diploma Program at Macdonald. Prior to his appointment to the Commission, he worked for many years in various capacities in the dairy industry in Ontario.

The Commission

The Canadian Dairy Commission, located in Ottawa, was established in 1966 as a federal Crown corporation which reports to Parliament through the Minister of Agriculture, currently the Honourable Eugene F. Whelan. The Commission is made up of three appointed Commissioners and has a support staff of 75 people. The Commission's objectives under the CDC Act of 1966/67 are:

- a) to provide efficient producers of milk and cream with the opportunity of obtaining a fair return for their labour and investment, and
- b) to provide consumers of dairy products with a continuous and adequate supply of dairy products of high quality.

It is responsible for the development and proposal of dairy policy to government and the administration of the support operations. It also chairs the Canadian Milk Supply Management Committee which is responsible for national supply management of industrial milk and cream.

Although not a large organization, the Commission's financial transactions are considerable. In 1981/82 for example, the level of activity was

\$1.29 billion including \$271 million in subsidy payments, \$170 million in levy receipts, \$820 million in purchases and sales of dairy products, and about \$25.8 million for marketing expenditures funded by government. The actual operating costs of the Commission, including a research program of roughly \$2.5 million, was \$5.1 million.

Dairy Policy Development

The Commission spends a considerable amount of time developing proposals for the annual national dairy program and for any program adjustments which might be required during the year. The initial proposals developed by the Commission are first submitted to the Minister of Agriculture and then, once approved by him, to a formal review process involving representatives of other federal departments whose responsibilities or interests may be affected by the proposals. If accommodation on major policy proposals can be reached at this interdepartmental committee stage, they are worked into the document; if not, dissenting departments brief their ministers who could then bring their concerns to the Cabinet meeting at which the dairy policy and annual program are discussed.

The Commission is continually dialoguing with the dairy industry, with the producers through their national organization, the Dairy Farmers of Canada, and with processors through their national organization, the National Dairy Council of Canada, and the various provincial marketing boards and agencies.

The basis for stability in the national industrial milk and cream sector, which involves about 63 per cent of all milk produced in Canada, is a federal Target Support Price for raw milk and cream paid to producers. The Target Price is calculated using a Returns Adjustment Formula and is supported in the marketplace by an offer-to-purchase butter and skim milk powder at prices related to the Target Price. As a result of this Canadian Dairy Commission administered program, the Target Price for industrial milk and cream helps to determine the milk ingredient cost in

other dairy products. In practice the intent is that milk should go first to manufacture dairy products other than butter and skim milk powder and only then is the residual milk to go into butter and skim milk powder for sale either directly into the market or to the Canadian Dairy Commission which will, in turn, resell the butter back into the marketplace when required and export the skim milk powder.

Price Support Program

The manner in which the Target Price for industrial milk is supported through the offer-to-purchase mechanism for butter and skim milk powder is illustrated in the following table. For example, the announced target price on August 1, 1983, was calculated on the basis of \$4.35 per kilogram of butter. As there are 4.32 kgs of butter per hectolitre of milk, this yields a return in the support price of \$19.66 per hectolitre for the butterfat ingredient in milk. For the skim milk powder ingredient, the support price is currently \$2.59 per kilogram, and as there are 8.24 kgs per hectolitre of standardized milk, the revenue from the skim milk solids portion is \$22.41 per hectolitre for a total of \$42.07. This assures the processing sector \$42.07 for the milk they purchase. In that price processors also have to cover the cost for processing milk into butter and skim milk powder; for that a processor's margin of \$5.30 is assumed. This would leave an estimated net return to the producer from the marketplace of \$36.77 per hectolitre. To that is added the direct government subsidy of \$6.03 for a \$42.80 target return for producers.

To review, the efficient dairy farmer has the opportunity to earn fair returns on labour and investment through a Target Price established by the federal government on the basis of a Returns Adjustment Formula which in turn is backed up by a price support program of offering to buy butter and skim milk powder.

The current practice is for there to be a maximum of three possible price changes a year. In recent years, this resulted in adjustments in January, April, and August. While a National Target Price is announced, the actual

price that is payable to producers is decided in each province through either direct government price setting mechanisms or through negotiations between the processors and producers. In some provinces, the milk prices are based on utilization i.e., whether it is going to making cheese, butter, ice cream, fluid milk, or other specialty products. The Canadian system provides for a great deal of flexibility on how this is implemented in each province and probably accounts for the great deal of cooperation that occurs across the country. (See table)

Table 1 How CDC purchases of butter and skim milk powder influence the price paid to farmers for industrial milk

Target Price on August 1, 1983			
Butter		Skim Milk Powder	
Dollars per kilo	\$4.55	\$2.59	Dollars per kilo
Amount of butter in a hl of milk	$\times 4.32$	$\times 8.24$	Amount of skim milk powder in a hl of milk
	\$19.66	\$22.41	
	\$42.07		Market Price Guarantee per hl
	-5.30		Assumed Processors' Margin
	\$36.77		Estimated Producers Market Returns
	+6.03		Direct Subsidy
	\$42.80		Target Returns Level per hl

Butter

As mentioned earlier, the Commission is involved in buying, transporting, warehousing, financing, and selling butter as a part of its offer-to-purchase program in support of the Target Price for farmers. The Commission continues to use butter purchases to influence the milk price because it still represents between 47 and 48 per cent of the end utilization of butterfat produced in Canada. The purchase of cheddar cheese was discontinued as it was found this additional intervention in the marketplace was not needed to make the price support mechanism operate effectively. The Commission purchases over 20 per cent of Canada's butter production each year. Any excess milk production is normally turned into butter for sale to the Commission which then resells on the world market. In the case of a shortage of butter in the domestic market, the Commission is the organization that would import it on a temporary basis.

Canada's milk requirements are determined on the basis of the butterfat content of dairy product demand. In this manner, all dairy product consumption can be met from domestic production with the exception of a small amount of cheese imported to provide additional varieties for the domestic market and to provide some access to the Canadian market as part of Canada's trading obligations. Through these mechanisms, we are assured of a plentiful supply of dairy products with the Canadian Dairy Commission taking care of butter and through it providing the price support for the milk ingredients in all other products.

In addition to buying butter from manufacturers at the same price across Canada, the Commission also delivers it to butter manufacturers or reworkers at a small transport cost of \$5 per metric tonne. This means that butter can be bought from the CDC in Vancouver at the same price as the CDC sells it in Toronto or Montreal. In this manner, Canadian consumers, no matter where they live, nor where milk and butter is produced, have much more stable prices for dairy products — and for butter in particular. The cost of this stability for consumers and producers to the government in terms of the financing, interest, storage, transport, etc., for butter involves about \$25 million a year.

Subsidy Payments

The Commission issues subsidy cheques on qualifying industrial milk and cream deliveries to roughly 50,000 dairy farmers per month. The subsidy, because it helps keep retail prices lower than they would be otherwise, is considered a consumer subsidy, although by keeping the retail prices down, it also enables a larger market for dairy farmers to supply and hence is considered to be of direct assistance to the industry. The rate of subsidy has remained at \$6.03 per hectolitre since it was introduced at this level in 1975. This represents about 48 cents on a kilogram of butter or skim milk powder. The basis of the Commission's payments to individual farmers are the production records received from all the milk marketing agencies across Canada. This is a large computerized operation with very rapid turn-around.

Supply Management

The supply management of industrial milk and cream in Canada is based on a federal/provincial agreement referred to as the Comprehensive Milk Marketing Plan. For two years provinces have been drafting a new National Milk Marketing Plan. A Committee was described in the original Plan to supervise and administer the agreement. This is the Canadian Milk Supply Management composed of representatives of provincial producer marketing boards and provincial government agencies and is chaired by the Canadian Dairy Commission which represents the federal government. It is this Committee which administers the national program while the Canadian Dairy Commission provides much of the estimates and background documentation, etc. With such a variety of opinions from very different farm, economic, and social circumstances across the country, achieving decisions which will be fully supported by all is quite a challenge. The Committee tries to achieve a consensus on issues before proceeding. Meetings are every second month or more often when there are particular problems that have to be addressed quicker. The Canadian system has become so widely recognized for its successes that representatives of countries in the European Economic Community, the United States, Australia, New Zealand, and even Japan have come to examine it and see what benefit it might be in their situations. The success of the Canadian system is largely due to its flexibility and the desire of the participants to support a national supply manage-

ment system in which each benefits only when the whole works properly.

For example, once the demand for dairy products for the year ahead has been estimated, the national quota for milk is decided upon. This includes quota in addition to that needed precisely to meet domestic need in order to provide flexibility for individual producers. The size of this "sleeve" is adjusted when necessary to ensure that farmers produce enough milk but not too much over-quota milk which must then be sold on the world market where the price is very low. It must be stressed that quota is not a permanent allocation but rather a share of the domestic market, whatever size that turns out to be. Depending on domestic consumption, production and the world market, the national MSQ is expanded or cut. The relative shares of each of the provinces are decided by the provinces themselves and not the federal government. The national quota can be adjusted during the year in order to keep milk production in line with changing market requirements. Milk produced but not covered by quota is sold on the world market and the producer of that milk receives whatever can be obtained from the sale of products from that milk.

With respect to quota policies that effect individual producers, the development, establishment and administration of provincial quota policies is something determined in each individual province. As a result, quota policies, including quota transfer systems, vary considerably from province to province depending on the farm, economic, and social circumstances of that province.

What helps to keep the quota system operating properly is the levy system which assesses costs involved with various levels of production of the individual dairy farmer. In this manner, producers share fairly in the costs and benefits of the national program. The levy costs are associated with the export costs of products produced surplus to the domestic market.

World Markets

As only about five per cent of total dairy product production is traded in international markets, any slight increase or decrease in supplies can

affect world market prices drastically. Most dairy exporting countries have domestic price stability programs and any surpluses produced are disposed of on the world market — in many cases heavily subsidized by the governments of those countries. Hence, prices paid for skim milk powder — and to some extent evaporated milk — are heavily influenced by competition in particular from countries such as the EEC and currently the United States. The United States has for the last couple of years had a serious problem of milk surpluses which they have been disposing of in some cases either as outright gifts or as low cost exports which have tended to replace sales normally made by traditional exporting countries such as ourselves. A case in point was the market in Mexico where Canada traditionally sold anywhere up to 45 thousand metric tonnes a year. Last year we had virtually no sales as a result of a combination American gift and low cost sale. The biggest price leader tends to be the European Economic Community. They dominate the world trade in terms of skim milk powder and surplus butter production and, therefore, their policy has a great impact on options open to us.

Currently Canada has virtually no skim milk powder left and what we do have is mostly all forward sold. In fact, future production is sold far enough ahead that we will be out of the market until next spring's production. However, both the U.S. and the EEC still have huge inventories of skim milk powder and butter. As there are very few markets for products of this volume, we see very little improvement in the near future in either world market prices or demand.

International Marketing of Dairy Products

A major part of the Commission's operations involves the selling on the world market of any products surplus to domestic demand. This is primarily centred on the more than two thirds of skim milk powder produced in Canada surplus to domestic needs and which must be sold on a very competitive world market. In order to obtain the best returns for that powder, the CDC tries to sell it as quickly as possible and, in fact, most of the time

tries to forward sell future production in order to keep storage, financing, and transport costs at the very minimum. In the very competitive world market, where plenty of products are available, skim milk powder beyond six months of age is generally regarded as no longer sufficiently fresh for human consumption and will be used for animal feed with a corresponding big drop in price. The Commission also markets evaporated milk and whole milk powder in consumer size packages which generally fetch better prices and more value added in Canada for the product sold. For the past three to four years, the Commission has been exporting in the area of six to eight million cases of evaporated milk per year under a special export program put in place for this purpose and agreed to by the dairy farmers.

Market and Product Research

This is the fourth year of the Commission's own research program into dairy product manufacture and marketing. The current annual budget is \$2.2 million. This research is not for on-farm production or management techniques as this area is already covered by Agriculture Canada and provincial ministries of Agriculture. The Commission's program is increasingly oriented towards applied research as opposed to pure research. Projects now require involvement by dairy processors or retailers that focus on increased consumption and utilization of dairy products. The program encourages development of new products, improvement of manufacturing efficiencies, and the finding of new markets for dairy products. There have been in excess of 125 projects funded in the last five to six years. The Commission has a publication available which describes all the projects undertaken so far and how to obtain copies.

Program Costs

The cost of a national dairy program can be found in all sorts of categories but the primary one used for comparison purposes is the straight dollar cost to taxpayers. It is estimated that the U.S. program is costing their taxpayers in the order of \$7.22 per capita. That support has in-

increased in recent years because accumulated stocks from previous years have not been disposed of. In the European Economic Community, the cost of support has been such that they have exhausted the budget for the current year and there is a crisis underway at this time. Although other countries, in particular their legislators, are fully aware that they have to do something about their problems, they seem to be having difficulties accepting the conclusion that Canada did years ago that the only effective program is some form of national supply management. A series of cost comparisons are provided in Table 2.

The Future

When looking into the crystal ball, we see supply management of industrial milk and cream along with supporting programs of formula pricing and the offer-to-purchase as being key components of federal dairy policies for years to come. Because of the success of the Commission's current market and product research

Table 2 Per Capita Government Expenditures

	— CDN \$ —		
	U.S.A.	E.E.C.	Canada
1979	\$ 7.22	\$28.50	\$12.28
1980	10.75	31.03	12.37
1981	11.84	20.69	12.38
1982	14.53	19.75 Est.	12.67
1983	13.40 Est.	17.72 Est.	12.61

program, this will continue as well. Dairy farmers will continue to be heavily involved in the promotion of their products — in particular through their advertising program which has already reached the level of about \$23 million a year simply for generic advertising and shared advertising on dairy products such as butter, ice cream, yogurt, etc. With respect to exports, the world market is small, it's unstable, highly subsidized, and very competitive. As sellers we are dependent on the purchasing power of dairy importing countries, who are primarily third world countries. Many of these countries were using oil revenues to finance their purchases. With present low world market prices for oil and reduced demand, their

dairy products purchases have been reduced as well. The world market for Canadian exports is essentially one utilizing marginal milk production. Those countries that can generally want to produce their own milk and as a result are fully filling their domestic demand. If they can generate excesses, they also want to export to third world countries. In the case of imports, we see their role as being fundamentally to help develop, for example in the case of cheese, a market for products not now being consumed or produced here in Canada. As the import quota is a fixed amount, imports can help enlarge the domestic demand for variety cheese which can then be supplied from domestic sources.



The Morgan Arboretum and Woodlands was awarded first prize for the Montreal Region in the 1983 Forestry Merit Competition on the theme "multiple use forestry." Some 60 entrants took part in the regional competition which is organized annually by the Quebec Department of Energy and Resources — Lands and Forests Division. The competition is intended to stimulate interest in private forest management by recognition of good work in conservation and management. Winners in each region receive artistic trophies and cash prizes — \$2,000 for first place. The regional competition is a semi-final with regional winners having a chance to win gold, silver, or bronze medals in the provincial final. The Morgan Arboretum is thus still in the running for a medal to be awarded at the provincial finals later in Quebec City. Professor J.D. MacArthur, Curator of the Arboretum, front, third from left, accepted the award.

(Continued from page 22)

a function not performed now by any organization in Canada, at least not regularly. Since 1982 plans have been developing to organize a Canadian Nutrition Foundation, funded by industry and managed jointly by scientists and industry representatives. This Foundation will have as its objectives the improvement of nutrition education, the dissemination of nutrition information, and the support of research. These objectives are all important to the subjects discussed but specifically the intent to regularly assemble expert groups to prepare statements on nutrition questions is most welcome. I am very happy to report that it now seems certain that the Foundation will be funded, will be established, and may very well be in operation in 1984.

This has been rather a desultory examination of Nutrition Research and Public Information but the conclusion is more clear-cut than the discussion leading to it; research must continue to play an essential role in developing worthwhile public information. May McGill continue to play a leading part in that endeavour.

Director of Macdonald Extension Service

Dr. L.E. Lloyd is pleased to announce the appointment of Mr. Marcel J. Couture as Director of the Macdonald Extension Service effective January 1, 1984.

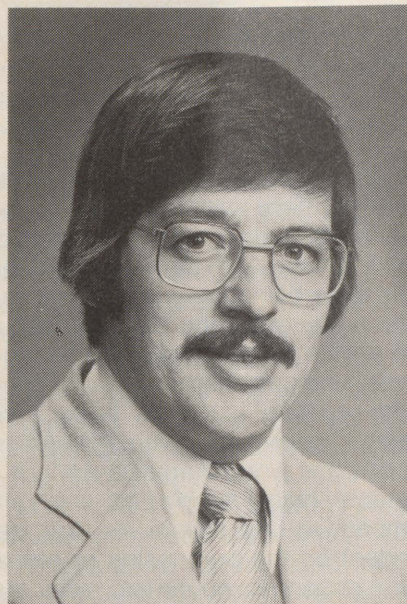
A native of the Eastern Townships and a 1965 graduate in the Diploma in Agriculture Program at Macdonald, Mr. Couture is a Farm Management Specialist. He also received his B.Sc.Agr. at Macdonald in 1972 and did further studies at Guelph University, where he received an M.Sc. in the field of Agricultural Economics and Extension Education in 1976.

Mr. Couture is currently Assistant Director of the Diploma Program where he teaches in the areas of farm management to the Diploma students; he also teaches at the undergraduate level. He will continue with his teaching and administrative duties in the Diploma Program.

Since his graduation from Macdonald College, Marcel Couture has worked in the private sector as a consultant in agriculture, for DHAS, for Agriculture Canada for a period of four years, and he was Quebec Manager for the Canfarm Farm Record System, before joining the staff of Macdonald College eight years ago. Mr. Couture has also written a text book in Farm Business Management which is at present used throughout the province of Quebec as well as in other colleges across Canada. He is a professional agrologist and a member of the Agricultural Institute of Canada, past president of the Canada Farm Management Association, and at present a member of the Canadian Society of Agricultural Economics and Farm Management Society.

In making this announcement, Dean Lloyd pointed out that Mr. Couture will be replacing Professor Pierre Jutras, who has recently left the position following a short but very fruitful tenure. Professor Jutras is on special assignment in Senegal for a period of two years.

Mr. Couture accepts his new appointment with the vigour which we are accustomed to expect from him. With



his background in Extension and his previous experience with DHAS, and Canfarm, he has a broad experience and knowledge of Quebec agriculture. He intends to continue the tradition of Macdonald College, where contact with the rural community, agri-business, our alumni, and the general public has always been very important.

DR. R. DOUGLAS, Agricultural Chemistry and Physics, has been appointed Chairman of the Canada Expert Committee on Agrometeorology.

DR. J. R. BIDER, Department of Renewable Resources, attended the Blackbird Research Coordination meeting sponsored by the United States Department of the Interior, Fish and Wildlife Service at Bowling Green, Kentucky. Invited participants discussed accomplishments and plans for future research toward the control of blackbirds and starlings in agricultural crops, feedlots, and roosts.

DR. SHIRLEY WEBER, Food Science, attended two meetings in Edmonton. The first was a meeting of the Council of Canadian University Food Science Administrators and was held in the Department of Food Science at the University of Alberta. The 15th annual meeting of Deans and Directors of Home Economics was held on the University of Alberta campus. There

were representatives from 18 universities at the meeting.

GARY HIRSHBERG, former director of New Alchemy Institute in Massachusetts and present Director of the Rural Education Center (Stoneyfield Farm, Wilton, New Hampshire) gave a talk on environmental problems and growing consumerism in southern China to Macdonald students and professors. The seminar was sponsored by the Ecological Agriculture Project and the Macdonald CUSO Committee.

PROFESSOR STUART HILL and Gary Hirshberg led a workshop on "Establishing an Ideal Village in Rural Quebec: Designing a Sustainable Food System" in November.

As part of their three-week tour of Canada, sponsored by CIDA, an Egyptian delegation of livestock and poultry specialists visited Macdonald College on November 26th.

PROFESSOR COFFIN, Department of Agricultural Economics, presented a paper on "Grain and Oilseed Marketing Board Operations in Eastern Canada" at the Canada Grain Council Semi-Annual Meeting held at London, Ontario.

PROFESSOR BRUCE DOWNEY, Department of Animal Science, presented two papers at the 1983 Maritime Cattle Technology Day held in Fredericton, N.B. This is the second year the event has been held; its aim is to help keep cattlemen abreast of present and future developments.

PROFESSOR WALLY SACKSTON, Department of Plant Science, was a guest speaker at the Nova Scotia Agricultural College at Truro. He also visited the Agriculture Canada Research Station at Kentville with Macdonald Plant Science grad students and now NSAC Professors, Bruce Gray and Glen Sampson.

PROFESSOR P. SCHUEPP, Department of Agricultural Chemistry and Physics, attended the Forest Environmental Measurements Conference in Oak Ridge, Tennessee. Sport



Dr. Estelle Mongeau of the Department of Nutrition at the University of Montreal recently gave a lecture on the "Recommended Nutrient Intakes for Canadians" to students in the School of Food Science. Dr. Mongeau, who received her Ph.D. in nutrition from Macdonald College, was a member of the national consultative group on the Dietary Standard for Canada. Dr. Mongeau, left, was welcomed back to the campus by Dr. Shirley Weber, Director of the School of Food Science.

off campus

ored by various international and U.S. agencies it provided the most up-to-date view on international research on turbulent transfer processes within and above forests. He presented a paper on measurements of turbulent fluxes of heat and CO₂ above forests from aircraft.

R. ROGER KNOWLES, Department of Microbiology, was invited to give lectures in the Biology Department of Washington University, St. Louis, Missouri, and **DR. E. S. IDZIAK** was the keynote Speaker at the Ontario Food Protection Association, Canadian College of Microbiologists, Canadian Institute of Food Science and Microbiology. He also attended a Symposium on Microbiology, Innovations and Update in Toronto. The topic was Indicator Organisms, Significance to an Effective Microbiological Analysis Program."

On December 1, 1983 in St. Louis, Missouri, **PROFESSOR DAVID BIRD**, Raptor Research Centre, chaired a full-day symposium of 20 paper presentations by speakers from the U.S., Canada, South Africa, England, and the Netherlands on the subject of raptorial species of the world. The symposium which was designed to spark collaborative research was organized by Dr. Bird in collaboration with the annual Raptor Research Foundation conference immediately following the event. All eight graduate students supervised by Dr. Bird at the Raptor Centre attended both the symposium and conference.



Dr. Shirley Weber, Director of the School of Food Science, left, was one of the staff members who welcomed Al and Fran Blenkhorn during their recent visit to Macdonald (see letter below).

MEMORIES

We really enjoyed our stopover at Macdonald College last Fall — reminiscing on the campus while noting the many changes that have taken place. We did appreciate the kindness of staff members who took the time to show us around the new building and to answer our many questions about people we knew.

We look forward to the Macdonald College Journal which keeps us informed about the happenings but particularly like to read about our classmates and others with whom we were associated.

Our classes were small allowing us to become very well acquainted. Many of us keep in touch, particularly at Christmas. We are scattered from Newfoundland to B.C., Britain, the United States, and Australia. Kay Munn Robertson in Australia promises us a visit.



I am enclosing a treasured snapshot (above) taken when three of us met for lunch in Toronto prior to going to the hospital to visit Marg Armitage Martin — Marjorie Hicks Doyle from Olds, Alberta, Ruth Cosman Clark, and myself. It was such fun.

Al and I had an occasion to visit with my roommate Dorothy Robertson Robertson in California — after 40 years we found that we even recognized each other. Brief visits and phone calls have always been welcomed over the years.

Since Graduation

Al spent two years with the Federal Department of Agriculture (Cereal Division) before joining the Army in 1940. He was overseas with the Royal Canadian Artillery for five years. After discharge in Canada in late 1945 he was employed by Maple Leaf Mills Co., Toronto, where he was General Manager of the seed department until his retirement in March 1980.

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Al and I were married in March 1944 while he was in Canada for six months. After discharge from the services we made our home in Toronto. We have reared four boys, two of whom are professional engineers, one an electrical contractor with his own business, and one an electrician. The three oldest are married and we are enjoying our four granddaughters and one grandson.

The retirement years so far have gone by very rapidly and we seem to have been able to keep ourselves very busy. We both are fortunate in being able to enjoy very good health and are able to partake in winter and summer sports. Al enjoys reading and I keep busy knitting and sewing. We spend a great deal of time at our cottage in Port Carling, Muskoka.

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(A sad note from Frances Blenkhorn in early January was to inform us that her classmate Marjorie Hicks Doyle passed away in November.)

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A Move to Ottawa

My wife Joy, our little boy Medhi, and I moved to Ottawa last year when Agrodev Canada Inc. moved its office from Beaconsfield to Ottawa. My present position is that of Project Manager responsible for the supervision and coordination of a number of projects the company is undertaking in Third World countries. On various assignments I was able to work with a number of Macdonald staff.

Joy (B.Sc. [Agr.] '74) has started working for the Canadian Pharmaceutical Association here in Ottawa, assisting with the editing of a book describing non-prescription drugs. Joy has had the chance to meet with some of our classmates in the Ottawa area.

Best of luck and continued success on the Journal. Keep the news coming.

Medhi Abdelwahab,
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SYLVYE DES MARCHAIS, B.Sc. (Agr.) '78, M.Sc. (Agr.) '82, has joined the staff of CIAQ (Centre d'insémination artificielle du Québec) in January 1984. Dr. John Moxley, Director of DHAS here at Macdonald, said that "Sylvye, who completed her Masters in Animal Genetics, was a valued member of the DHAS research group connected with dairy cattle reproduction."

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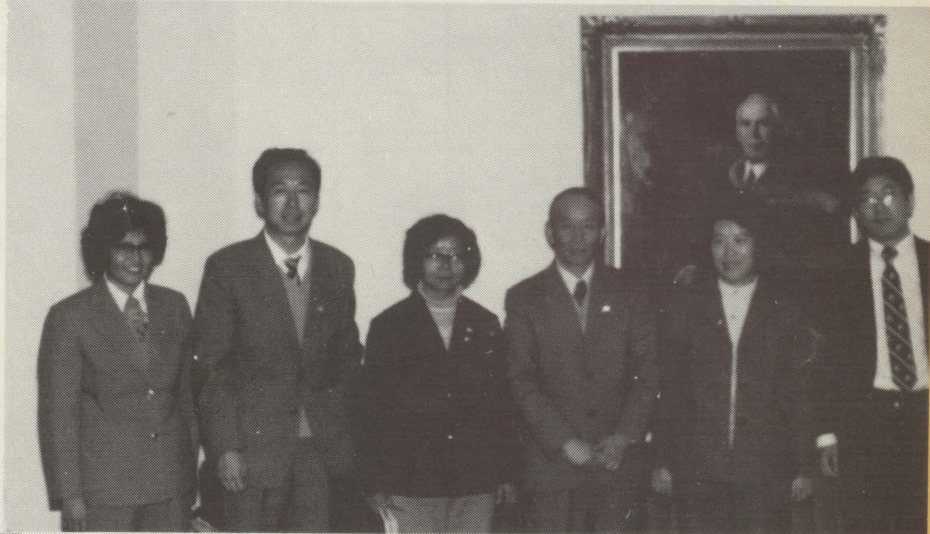
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An update course "Dietetics Today" was given through Extension last fall to some 12 students, the majority of whom were Mac graduates. Students attended lectures, seminars, and demonstrations given by staff in the School of Food Science.



Ginette Lamontagne of McGill International, left, and Dean L.E. Lloyd extend a warm welcome to Dr. Mary Mackey of Memorial University's Extension Service.

Visitors to the campus recently included a group from the library of the Chinese Academy of Agricultural Sciences in Peking.



The Population Biology Committee of the Natural Science and Engineering Research Council (NSERC) recently visited Wildlife (above), Plant Science, Microbiology, and the Institute of Parasitology.